

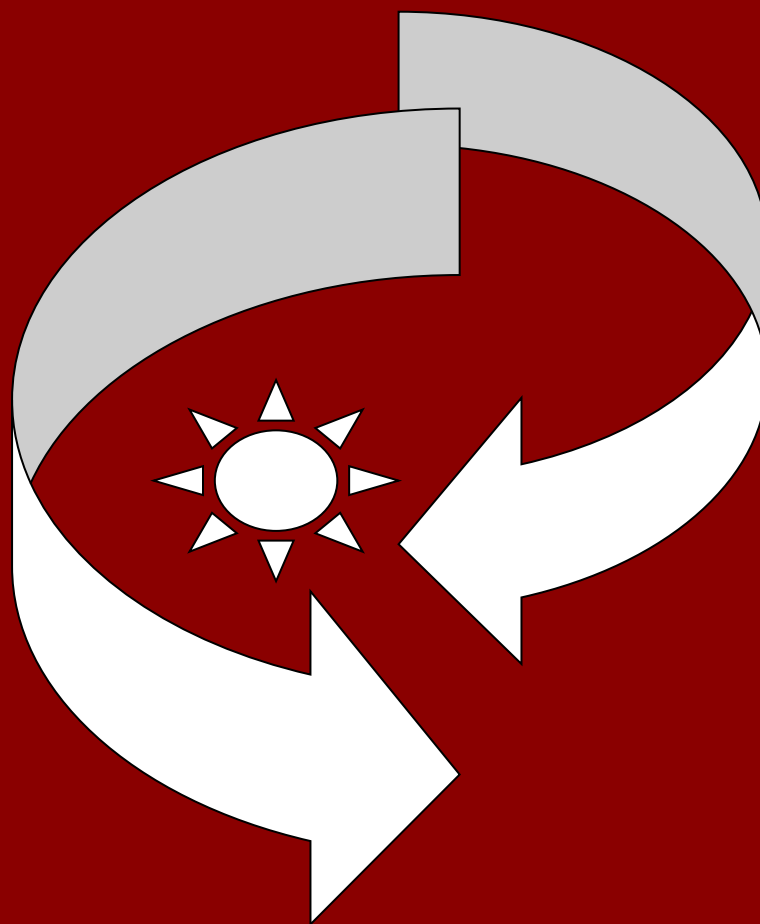
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Jurnal Perspektif Pembiayaan dan Pembangunan Daerah (Journal of Perspectives of Financing and Regional Development)

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Editor's Note

Since Volume 6, Issues 2 (September – October 2018), the Journal of Perspectives on Financing and Regional Development has been nationally accredited with SINTA (Science and Technology Index) score of S2, based on the Decree of the Director General of Development and Research Enhancement, Ministry of Research, Technology & Higher Education of the Republic of Indonesia, Number 10/E/KTP/2019 concerning the Ranking of Scientific Journal.

In Volume 6 Issue 6, 2019 is presented eleven articles that come from Universitas Jambi (Indonesia), Universitas Andalas (Indonesia), Universitas Negeri Gorontalo (Indonesia), PPM School of Management (Indonesia), Insitut Teknologi Bandung (Indonesia), University of Maiduguri (Nigeria), Academy of Personnel Management, (Ukraine), Academy of Sciences of Ukraine (Ukraine), Landmark University (Nigeria), School of Economics, Finance & Banking (SEFB), Universiti Utara Malaysia (Malaysia) and Lagos State College of Primary Education (Nigeria)

Hopefully in the next issue can be presented articles with issues and from more diverse circles.

Happy joy reading

Editorial

Non-linear return to human capital for workers of productive sectors in Indonesia

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Abstract

This study is aimed to investigate a typical return to human capital for workers of productive economic sectors in Indonesia. Instead of satisfying Mincer's linearity assumption, we use a piecewise linear spline function in order to trace marginal returns to education and job tenure and to find out how large the returns to both variables could be moderated by certain variables. The research is conducted on 2609 individuals who work for Indonesian top-five productive sectors in 2016, as recorded in National Work Force Survey (SAKERNAS). We implement quantile regression analysis to produce three levels earning model. The result shows that the return to education varies across schooling level and apparently negative for academy schooling. We also find that job training participation does not always enhance the return to education especially for higher earning workers. The return to job tenure is found to diminish during career length. However, graduating from certain college majors significantly slowdown the diminishing return to job tenure and thus promoting better career. Based on these findings, we outline several ideas concerned to developing higher education and job training provision in national scale for more efficient supply of human capital in the productive sectors.

Keywords: *Human capital, Education, Job tenure, Marginal return*

JEL classification: I2, J3

INTRODUCTION

According to BPS (2017, 2017b), among the seventeen economic sectors of Indonesia, the real estate (RE); information and communication (IC); mining and excavation (ME); electricity and gas (EG); and financial services (FS) are the highest in worker productivity and wage rate offered. It is also revealed by BPS (2017, 2017b) that each sector has its special advantages or potentials beside leading in productivity. ME has become one of the largest national output contributors. FS and IC are the fastest in growing output and predicted to take over ME's position in top five large output sectors within the next eight years. RE incorporation with other service sectors are globally offering more future job opportunities along with the declining labor demand in agricultural and manufacture sectors. Given this advantages, Indonesia should have be more prepared and be oriented to supply qualified labor for these sectors.

It is commonly known in economics that high productivity could be achieved through input efficiency or by maximizing output. Since human capital has become a factor that enhances individual and sectoral work efficiency (Kim & Mohtadi, 1992; Saraswati, 2012; Wilson & Briscoe, 2004; Fahmy, Bachtiar & Sari, 2016), higher labor productivity in Indonesian productive sectors should also reflect higher level of human

capital embodied by the workers. This motivates us to examine a typical effect of human capital in the productive sectors which distinguish it from workers of other economic sectors. Also, we consider that it is urgent to yield a more relevant estimate of the return to human capital by specifying the effects into a number of earning quantiles that may reflect earning levels. To reach this objective, we attempt to implement a non-linear approach in estimating the return to human capital via quantile regression. With major transitions in economic view on education after Mincer's era, the non-linear return to human capital is considered to be a more relevant tool for explaining today's labor supply dynamics (Heckman, Lochner & Todd, 2003).

The human capital theory, introduced by Becker (1962), Schultz (1961) and Mincer (1974), has long become a cornerstone to human resource planning for its practicality in specifying earning relationships. The theory has also been widely applied in various scale of studies in Indonesia. Elfindri & Bachtiar (2003) compiled a number of similar studies nationwide and successfully highlighted the advantages of vocational education in giving larger returns and labor market signals. Some positive individual benefits of schooling concerning the rise of income had also been found in the studies of Purnastuti, Wahyuni, & Mustofa (2015), Suhardan, Riduwan & Enas (2012), and Magdalyn (2013). Lastly, Fahmy, Bachtiar & Sari (2016) examined the effect of human capital on earning of migrant workers and found that improving formal education, formal job experience and participating in particular job training resulted in higher wage and better job status when working abroad.

Valuable inputs and criticism to the human capital theory has also been consistently contributed. The linear assumption of education which established Mincer's model (1974) was then examined for relevancy. Non-linear approaches such as Sheepskin Effects, quadratic estimate or some more flexible wage functions have been introduced into many estimation strategies instead of Mincer's model within recent two decades. Soderböm (2004) revealed that when using a continuous spline wage function, the marginal returns to additional years of schooling could be documented for the case of Kenyan and Tanzanian manufacturers. Trostel (2005) used quadratic approaches and showed that Mincer's model overestimates the returns to elementary and tertiary education and underestimate those to middle education. Akguç (2011), using a stepwise wage function, found that the return to high education was larger for developed countries, meanwhile the return to lower education was larger for poorer countries.

We appraise that by using a typical non-linear estimation strategy, it would provides better precision in the measures of return to human capital for workers in Indonesian most productive sectors. Indonesia like many other developing countries, has a large number of workers with lower education yet shows a promising rise of highly-educated workers (those who graduate from academy and university) (BPS, 2016, 2017a, 2017b). The phenomenon in Indonesian productive sectors could be the opposite, that the workers may receive better education and training to compete for better productivity and career. It would be intriguing to find out for these sectors, how additional years of schooling give marginal effects to certain levels of earning. We would like to prove if higher education gives larger benefit, as those found in developed countries in which the race between education and career is competitive. However, since the case takes place in Indonesia, socio-demographic influences are not unavoidable.

Male preference in labor market has been becoming the persisting factor that often relates to earning gap problems. It structurally affects earning in the way it affects education opportunities in Indonesian society. For instance, within the same level of education, Indonesian male workers benefit more than females by acquiring better job

position, thus have bigger wage (BPS, 2017). It is clarified by Purnastuti, Miller & Salim (2011) that female workers receive greater return to their education. Wahyuni & Monika (2016) found that at certain point of higher education, Indonesian female workers may advance their wages over male, thus the earning gap between both genders could be reduced by increasing female's schooling level in general. These evidences lead us to examine if male sex could be a strong moderator for marginal effect of additional years schooling on workers earning.

Other studies had also revealed the earning differentials emerging among workers who graduated from equal schooling level: general and vocational middle-high school. Elfindri & Bachtiar (2003) found that labor market signals were stronger for the vocational school graduates and thus promised better earning. Furthermore, Adrimas (2004) argued that the return to vocational education were potentially higher in an industrialized region or country. Despite these advantages, developing vocational education at the moment becomes more challenging and complex since the demands for manufacturing skills decline and shift to globally competitive service skills which seems to be less anticipated by vocational curriculum in Indonesia. The global weakening in the return to vocational education had been revealed by Brunello & Rocco (2015). They found that the earning profile of vocational graduates were only superior in young ages and became inferior in the rest of their working age. They argued that such weakening was caused by the lack motivation of vocational graduates to invest more in human capital. Taking these facts into account, we predict that Indonesian vocational education could potentially become an indeterminate or insignificant moderator for the modern return to education, especially in productive sectors.

Investigation of how participating in job training could moderate the return to education is appropriately considered. As proposed by Lynch (1992) that completing the job training resulted in the earning increase for highly-educated workers. Becker (1992) argued that a profit-maximizing firm could avoid the training cost for its educated labor and in returns, the educated labor would be offered a higher wage rate. He also argued that specific training could strengthen the connection between labors and firm, meaning that trained labors would have less intention of job turnover. These implies that job training possibly is a positive moderator for the return to education. However, the effectiveness of job training depends on the time that spans from its completion to the date. Lillard & Tan in Smith (2001) found that a on-the-job training raised the earning in approximately 13 years and decreased afterwards, while the school-job-training is found to be beneficial in about 7 years since its completion.

Job experience has become another prominent time-based investment beside schooling. It accumulates human capital of a worker through practical learning (Schultz, 1961; Mincer, 1974). As known that Mincer (1974) used what is so called "potential labor market experience", defined as the rest of worker's age after finishing his/her schooling, to be his proxy of job experience. In this context of this study we consider to use a different proxy of job experience for some reasons. First, the Indonesian workers seem to have a high tendency of job turnover if they work in informal sectors and in the opposite, formal Indonesian workers seem to have less tendency as they are also threatened under contract-canceling penalty (BPS, 2017). Secondly, a higher wage rate offered in productive sectors (BPS, 2017) may attract workers to stay longer in the current job and invest more for their career. Therefore, we would rather use "job tenure" as our proxy of job experience and expect that a real career moderation effect could also be estimated by using this proxy.

Graduating from certain education has also been known to benefit someone's

career. The idea was studied by Cho, Kam, & Lee (2017) and found that completing education in certain college majors in South Korea determined higher labor market participation, earning level and job position. This idea is analogous to what Adrimas (2004) proposed about the effectiveness of vocational education in certain phases of economic development in a region or country. For the case of Indonesia, we prefer to investigate the moderation effect of graduating from engineering, economics and sciences college majors in the return to job tenure. According to some studies in Suhardan, Riduwan & Enas (2012), studying in these college majors had returned the greatest individual and social benefits for Indonesian graduates.

METHODS

Empirical framework

Let X to be a set of human capital embodied by a worker of productive sector as and E to be the nominal earning of the worker. As we examine the effect of X on E , we state our baseline estimation model as follows:

$$\ln E = f(X) = f_1(Sch, m_i^{Sch}) + f_2(Exp, m_k^{Exp}) + \alpha X_c + \varepsilon \dots\dots\dots (1)$$

where f is a earning function, Sch is the years of schooling, $m_i^{Sch} \in \{0,1\}$ is a number of i moderators for the return to education, f_1 is a subfunction with typical slope given Sch and m_i^{Sch} , Exp is years of job tenure, $m_k^{Exp} \in \{0,1\}$ a number of j moderators in the return to job tenure, f_2 is a subfunction with typical slope given Exp and m_k^{Exp} , $X_c = (dTrai, age, age^2, dSex, dLoc, dMar)$ is a vector of other characteristics of a worker that includes respectively the participation in the job training (equals 1 if participating, 0 otherwise), age, squared age, male sex (equals 1 if male, 0 otherwise), living in urban areas (equals 1 if living in urban, 0 otherwise), and marital status (equals 1 if married or ever married, 0 otherwise). α is estimated parameter of X_c and ε is the residual or unobserved abilities.

By involving a number of moderations and applying a non-linear assumption for the return to education, we define f_1 as a piecewise spline function as suggested by Soderbom (2004), declared as follows:

$$f_1(Sch, m_i^{Sch}) = \begin{cases} (\beta_0 + \gamma_{i0}m_i^{Sch})Sch, & 0 \leq Sch \leq S_1 \dots\dots\dots (2) \\ \sum_{j=1}^N ((\beta_j + \gamma_{ij}m_i^{Sch}) \mathbf{max}(Sch - S_j, 0)), & S_j < Sch \leq S_{j+1} \dots\dots\dots (3) \end{cases}$$

where $S_{j=1,2,\dots,N}$ denotes the j -th level of schooling. The basic return to the lowest education level ($0 \leq Sch \leq S_1$) is given by the slope of equation piece-(2) as large as $\beta_0 + \gamma_{i0}m_i^{Sch}$. Changes of slope in the next j schooling levels ($S_j < Sch \leq S_{j+1}$), noticed as the marginal returns to education, is given by the slope of equation piece-(3) as large as $\beta_j + \gamma_{ij}m_i^{Sch}$. If the marginal returns to education in all schooling intervals $[S_j, S_{j+1}]$ are not detectable, that is

$$\beta_1 + \gamma_{i1}m_i^{Sch} = \dots = \beta_N + \gamma_{iN}m_i^{Sch} = 0 \dots\dots\dots (4)$$

then the schooling function f_1 is linear¹.

To specify the pieces of f_1 , we categorize years of schooling into certain intervals commonly known as ‘schooling levels or education attainment’ in Indonesian labor

¹ This is our main hypothesis to prove non linearity of the effect of education on earning. Rejection to this hypothesis is based on p-value generated by Wald’s test for joint significance for selected independent variables.

market: the basic/compulsory education ($S_1 = [0,9]$); continuing to middle high education ($S_2 = (9,12]$); continuing to university education ($S_3 = (12,16]$); and continuing to post graduate education ($S_4 = (16,22]$). Based on what we have proposed in the previous section, the moderators of the return to education would consist of graduating from middle-high vocational school (denoted by $dVoc$, equals 1 if graduating and 0 otherwise), participating in certified job training ($dTrai$), and the male sex ($dSex$). All moderation effects would be investigated for all schooling levels except for the $dVoc^2$.

As we also assume that the return to job tenure is non-linear, we then use quadratic approach in our estimation since the years of job tenure in the productive sectors is possibly long enough and would potentially behaves similar to age. Therefore, we define f_2 as follows:

$$f_2(Exp, m_k^{Exp}) = \eta_1 Exp + \eta_2 Exp \cdot m_k^{Exp} + \eta_3 Exp^2 \dots\dots\dots (5)$$

where the only moderator for the slope of f_2 is graduating from engineering, economics and science college majors ($dSuppMaj$, 1 if graduating and 0 otherwise). The return to job tenure is constituted by η_1, η_2 and η_3 .

Data

The data for this study is compiled from National Work Force Survey (Sakernas) dataset which was recorded in August 2016 by Indonesian office of statistics: Badan Pusat Statistik (BPS). The dataset contains 2609 records of those worked in five Indonesian most productive sectors. The records consist of 131 workers in real estate, 308 workers in information and communication, 1123 workers in mining and excavation, 180 workers in electricity and gas, and 867 workers in financial services. All individuals work formally as labors/employees (i.e none with status as enterprenur, casual or family worker).

Technique of analysis

The quantile regression is implemented to examine and trace the return to human capital in certain levels of earning. There are some advantages could be gained from using this technique in processing our cross-sectional data. First, the quantile regression does not require the data to be specifically distributed (such as to be normal in OLS) or satisfy other classical assumptions. Secondly, this technique is robust to outliers as it is median-based (Wahyuni dan Monika, 2016) and thus, is considered to be very appropriate to handle earning/income distribution data which is not .

According to Saidah, Yanuar, & Devianto, (2017) and Wahyuni dan Monika (2016), a regression equation at τ -th quantile is written:

$$y_i = \mathbf{x}_i^T \beta_\tau + \mu_i, \quad i = 1, 2, \dots, n \dots\dots\dots (6)$$

where the parameters β_τ is estimated by

$$\hat{\beta}_\tau = \underset{\beta_\tau}{\operatorname{argmin}} \sum_{i=1}^n \rho_\tau(y_i - \hat{y}_i) \dots\dots\dots (7)$$

given $\rho_\tau(\cdot)$ is an asymmetric loss function of residuals, defined as:

$$\rho_\tau(\mu) = \begin{cases} \tau\mu, & \mu \geq 0 \\ (1 - \tau)\mu, & \mu < 0 \end{cases} \dots\dots\dots (8)$$

² The effect of $dVoc$ is observable at the phase of S_2 . It would be a very weak assumption that the return of education for vocational high school graduates to be non linear since there is only one cutpoint for Sch . Therefore, we simply assume for this case that $dVoc$ moderates the return to education in linear fashion.

therefore the estimation can be rewritten as:

$$\hat{\beta}_\tau = \underset{\beta_\tau}{\operatorname{argmin}} \sum_{i \in \{i|y_i \geq \hat{y}_i\}} \tau |y_i - \mathbf{x}_i^T \beta_\tau| + \underset{\beta_\tau}{\operatorname{argmin}} \sum_{i \in \{i|y_i < \hat{y}_i\}} (\tau - 1) |y_i - \mathbf{x}_i^T \beta_\tau| \dots\dots\dots(9)$$

which is a minimization problem solved through linear programming (Koenker dan Basset, 1978).

We use a measure of the goodness of fit for our regression models which is introduced by Koenker dan Machado (1999) as a Pseudo-R² that is analogous to R² in the OLS technique, calculated as follows:

$$R^1(\tau) = 1 - \frac{\sum_{i \in \{i|y_i \geq \hat{y}_i\}} \tau |y_i - \hat{y}_i| + \sum_{i \in \{i|y_i < \hat{y}_i\}} (\tau - 1) |y_i - \hat{y}_i|}{\sum_{i \in \{i|y_i \geq \tilde{y}\}} \tau |y_i - \tilde{y}| + \sum_{i \in \{i|y_i < \tilde{y}\}} (\tau - 1) |y_i - \tilde{y}|} \dots\dots\dots (10)$$

where \hat{y}_i is the predicted y_i through the quantile regression between Y and all independent variables and \tilde{y} is a constant prediction of y_i obtained from performing quantile regression between Y and intercept only.

RESULTS AND DISCUSSION

The profile of respondents

Table 1 shows that the average monthly earning of our respondents is Rp. 3.25 million, which is higher than national average³. This is close to the minimum wage of DKI Jakarta in 2017 (Rp. 3.36 million), which is the highest among all provinces of Indonesia. It indicates that the workers earning in the productive sectors is competitive as we have presumed.

Table 1. Summary statistics

No	Variables (measurement unit)	Mean	Median	S.D	Min.	Max.
1	Monthly earning (million Rp.)	3.25	2.40	3.75	0.03	60.00
2	Years of schooling (year)	11.0	12.0	4.29	0.00	18.0
3	Job training participation (yes/no)	0.27	0.00	0.44	0.00	1.00
4	Years of job tenure (year)	6.36	4.00	6.86	0.00	45.0
5	Age (year)	35.60	34.00	11.40	15.00	88.00
6	Male sex (yes/no)	0.79	1.00	0.41	0.00	1.00
7	Living in urban areas (yes/no)	0.63	1.00	0.48	0.00	1.00
8	Married/ever married (yes/no)	0.73	1.00	0.45	0.00	1.00
9	Graduating from engineering, economics and sciences college majors (yes/no)	0.20	0.00	0.40	0.00	1.00
10	Graduating from vocational high school (yes/no)	0.14	0.00	0.35	0.00	1.00
Total sample				2609		

Based on statistics in Table 1, the sample are mainly distributed in lower earning level, shorter job tenure and younger in age, yet in higher years of schooling group. Male, urban and married workers are the largest part of the sample, indicating that even in the most productive economic sectors, demographic factors may have dominant influences on job participation. On the other sides, the representation of economic effect in the sample consisting of the proportions of job training participation, supportive college majors and vocational high school graduation are relatively low⁴.

³ According to BPS (2017a), the average of minimum wage of all 34 provinces is Rp. 1.97 million in 2016.

⁴ The demographic-economic factors size imbalance in our sample may lead to some bias if estimated via quantile regression. Many literatures have suggested for using Heckman’s test for selectivity (or Heckit)

By education attainment, 25.7 percent of the respondent have completed general high school education. The number of lowly educated respondent, consisting of those who never attended school, completed elementary school, and completed junior high school, are respectively 6.3; 14.2 and 13 percent. Compared to national labor composition which is dominated by elementary and junior high school graduates (BPS, 2017b), most of workers in the productive sectors attain better education and thus may give an advantage in developing potential job skills and better income.

By training history, 26.8 percent of the respondents have participated in certified job trainings. The average earning of trained respondents (Rp. 4.98 million) is almost twice the earning of those untrained (Rp. 2.62 million). It implies that job training participation induces larger impact on workers earning as proposed theoretically by Becker (1962, 1992). However, the low rate of job training participation should be concerned and may relates to certain issues. To the date, Indonesia only have around 300 vocational training centres (known as BLK, public and private) across the nation with lack of infrastructures and promotional activities to society. As the job training system in BLK is more supply-driven than demand-driven, the variation of training curriculum offered, the industrial cooperation and the quality assurance provided by these intitutions become limited (Skjaerlund and van der Loop, 2015). This is possibly the reason that the workers of the productive sectors may have participated less in formal/certified training, yet not the one that restricts them from participating non formal trainings which support their careers.

By job tenure, it is recorded that most of the respondents have been working under 6.36 years at their current jobs. Since the sample consists of more young agers, such years of tenure may indicate a low tendency in job turnover. The career in these sectors seems to be promising. We calculate the earning rise is stable if workers stay around 30 years at current jobs. This long term potential rise in earning has strong connection with the formality of jobs in these sectors.

By sex, 79.3 percent of total respondents are male with average earning 12 percent higher than females. We calculate that the female workers averagely earn more than males only in young age and gradually earn less for the rest of their career. Male workers seem to start having lower earning after the 25-29th year of working, while females are faster, after the 20-24th year of working. Contrast to male workers, most females in Indonesia tend to invest less in human capital after marriage. As stated in BPS (2017a), the social role of Indonesian females has been widely more a priority than economic one.

By place of living, around 62.6 percent of repondents live in urban areas and earn almost 60 percent higher than rural workers. The high gap is potentially caused by the wide availability of productive jobs, higher wage rate in urban areas and the migration for human capital.

By marital status, ever married respondents also earn higher than those who never-married. The earning gap between the two groups reaches 42 percent. Ever-married workers are potentially older and have longer years of career at the current job. In addition to that, ever-married workers are more motivated to invest to acquire skills and expand their networks needed to enhance their productivity.

The return to human capital of workers in Indonesian productive sectors

Table 2 shows our estimates for the coefficient of all explanatory variables using

before performing OLS technique, but as far we have studied none has suggested to run the method with quantile regression. Besides, it is strongly necessary to underlie the choosing of 'selection variables' in Heckman test with qualitative findings for cases of productive workers job participation.

quantile regression. We prove that the returns to education and career are non-linear. On education, we find that additional years of schooling does not yield equal marginal effects on workers earning for all schooling intervals observed. This satisfies the nonlinearity condition as stated in Equation (4). Precisely, we reject the linearity hypothesis at 1-5% of significance level. We also find that, for all terms that interact with schooling intervals (job training participation and male sex), the nonlinearities are significant for some quantiles. On workers career, we find that all coefficients associated to years of tenure (*exp*) and squared years of tenure (*exp*²) are statistically significant, holding firmly the form of our non-linear definition in Equation (5).

Table 2. Full specification quantile estimates

Variables	Coefficient (standard error)		
	Q1 (0,25)	Q2 (0,5)	Q3 (0,75)
const	11.726 (0.228) ^{***}	12.245 (0.143) ^{***}	12.763 (0.164) ^{***}
sch	-0.014 (0.024)	0.042 (0.015) ^{***}	0.054 (0.018) ^{***}
dTrai	-0.357 (0.459)	0.154 (0.288)	0.661 (0.331) ^{**}
dSex	0.756 (0.162) ^{***}	0.919 (0.102) ^{***}	0.638 (0.117) ^{**}
max(sch – 9,0)	0.332 (0.068) ^{***}	0.188 (0.042) ^{***}	0.113 (0.049) ^{**}
max(sch – 12,0)	-0.110 (0.063) [*]	-0.088 (0.040) ^{**}	-0.049 (0.045)
max(sch – 16,0)	0.082 (0.323)	0.282 (0.202)	0.481 (0.232) ^{**}
dTrai×sch	0.083 (0.057)	0.021 (0.036)	-0.018 (0.041)
max(sch – 9,0)×dTrai	-0.119 (0.098)	-0.059 (0.061)	-0.047 (0.071)
max(sch – 12,0)×dTrai	0.004 (0.068)	0.011 (0.043)	0.018 (0.049)
max(sch – 16,0)×dTrai	-0.285 (0.235)	-0.440 (0.147) ^{***}	-0.553 (0.169) ^{***}
dSex×sch	0.044 (0.026) [*]	-0.022 (0.017)	-0.021 (0.019)
max(sch – 9,0)×dSex	-0.273 (0.071) ^{***}	-0.145 (0.045) ^{***}	-0.083 (0.051)
max(sch – 12,0)×dSex	0.123 (0.066) [*]	0.131 (0.041) ^{***}	0.099 (0.047) ^{**}
max(sch – 16,0)×dSex	0.375 (0.268)	0.235 (0.168)	0.129 (0.193)
dVoc×sch	-0.002 (0.005)	0.001 (0.003)	0.000 (0.003)
exp	0.040 (0.008) ^{***}	0.037 (0.005) ^{***}	0.044 (0.006) ^{***}
dSuppMaj×exp	0.017 (0.005) ^{***}	0.014 (0.003) ^{***}	0.015 (0.004) ^{***}
exp ²	-0.001 (0.000) ^{***}	-0.001 (0.000) ^{***}	-0.001 (0.000) ^{***}
age	0.058 (0.010) ^{***}	0.043 (0.006) ^{***}	0.042 (0.007) ^{***}
age ²	-0.001 (0.000) ^{***}	-0.001 (0.000) ^{***}	0.000 (0.000) ^{***}
dLoc	0.101 (0.040) ^{**}	0.162 (0.025) ^{***}	0.058 (0.029) ^{**}
dMar	0.024 (0.052)	0.092 (0.032) ^{***}	0.051 (0.037)
<i>Wald-Test</i> : linear return to education (p-value)	0.0000 ⁺	0.0000 ⁺	0.0037 ⁺
<i>Wald-Test</i> : linear moderation of training participation in the return to education (p-value)	0.1446	0.0104 [×]	0.0091 ⁺
<i>Wald-Test</i> : linear moderation of sex in the return to education (p-value)	0.0000 ⁺	0.0031 ⁺	0.1407
pseudo-R ²	0.215	0.246	0.254

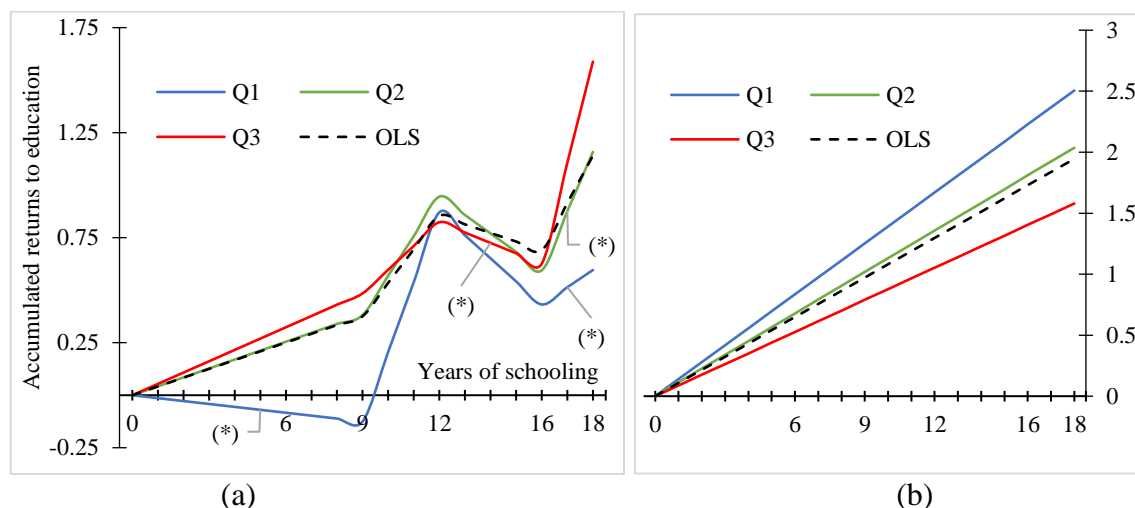
Notes: ^{***}, ^{**}, ^{*} significant at 1%; 5%; 10%
⁺, [×] rejects the linearity at 1% and 5%

How education affects earning?

It is found that the return to education (RTE) is non linear or not equal across all schooling levels. It implies that some workers may benefit more from completing certain

level of schooling. In association to earning levels, the high-earning workers benefit more from compulsory and postgraduate schooling, meanwhile the low-earning workers benefit more from middle-high education. Using the regression estimates, we illustrate the typical curve of non linear RTE on Graph 2(a). We also provide an illustration of RTE under linear assumption (Mincer's) on Graph 2(b) based on estimates provided in Table A1 (see Appendix). One could notice potential under/over estimation may be resulted if linear estimation is performed.

In this discussion, we concern more on the form of the nonlinearity than on the magnitude of marginal return itself within each domain. Previous studies conducted by and Schady (2003) and Akguç (2011) stated that the returns to postsecondary (academy, university and postgraduate) education are commonly greater than to lower levels of education. Suhardan, Riduwan & Enas (2012) supported with finding that Indonesian workers and society benefit more from individual and public investments in university education. Apparently in this study, we find that the marginal returns to one interval of postsecondary education (12-16 years of schooling, i.e the academy and university) are smaller and in fact, are negatives. It means that additional year spent to study in college reduce workers earning by around 8-11 percent.



Graph 2. Comparison between non linear and linear return to education for workers in productive sectors

Notes: (*) insignificant marginal effect

This finding is contradictory to theories and previous empirical results and may indicate some problems in investment of higher education. Our calculation as shown in Table A4 (see Appendix) shows negative and positive changes in median earning⁵ between high school and academy graduates. Therefore, we believe that this is a special case of problematic labor signaling for academy education which is a subset of (12,16] years of schooling. According to Lusia & Amelia (2018), it is quite common that in obtaining labor input, local industries prefer bachelor graduates despite their satisfaction on ‘the actual On The Job achievement’ contributed by vocational school trainees (including academy students) in internship programmes. In other words, signal dominates over qualification in the labor market for academy graduates. It implies that for academy education, due to such a weak labor market signals, job opportunities become small. This crisis imposes academy graduates to avoid unemployment by willing to be paid lower,

⁵ Since quantile regression is a generalized method of median regression, it is more appropriate to use 25%, 50% and 75% percentiles to explain the regression results rather than using mean value.

thus contributes to lowering the total return to the (12-16] schooling interval.

The role of vocational schooling (known as SMK) is not deterministic in Indonesian productive industries. With $dVoc$ estimates are insignificant for all earning level, it implies that either a worker in these sectors graduate from SMK or general high school, the earning remain potentially same. Since these productive sectors are competitive, SMK's graduates are demanded to invest more by participating in job training and non formal education to raise their productivity. However, according to Brunello and Rocco (2015), vocational school graduates seem to have lower incentive to invest in human capital after being employed. Beyond the supply side, low demand for vocational school graduates in national labor market may have also been a troublemaking factor. According to Kadir, Nirwansyah & Bachrul (2016), Indonesian productive and exportive industries are in shortage of suitably skilled workers and cannot absorb enough qualified SMK graduates who are mostly (49%) from business and management backgrounds.

How job training participation and sex moderates the RTE?

Overall effect of job training participation (JTP) on earning is found not to be always positive, as JTP may enhance and lower the return to schooling in some cases. From the estimates associated to $dTrai$ in Table 1, it is revealed that the moderating effects of JTP are not significant for lower-earning workers, but vary in some schooling intervals for the middle and higher earning workers.

Workers with lower earning is often attributed empirically to lower level of education, younger age, less working experience, and female. Smith (2001) found that young agers tend to change jobs more frequently and participate in various job training which lead to ineffectivity of their JTP on current job earning. Lynch (1992) found that females tend to participate less in job training and cause to receive lower wages. Regarding these facts, it is indicated that job trainings would be less or not effective when given to such worker characteristics.

For the middle and high-earning workers, the non-equal moderations of JTP on RTE across schooling levels are significant (based on Wald's test for joint significance with p-value repectively of 0.0104 and 0,0091). Apparently, JTP lower the RTE for these two groups with negative estimates values for $\max(\text{sch} - 16, 0) \times dTrai$. It means that the interaction between master/doctoral schooling and JTP results in a slightly decrease in earning. It indicates there is a mismatch between higher education and job training for middle and high-earning workers in productive sectors in Indonesia. Recall our explanation on the defect of Indonesian formal training system may help one to understand the education-training complementary gap as happens in this case. Fouarge, Schils & de Grip (2010) found that the higher willingness of highly educated workers to participate in formal/certified job training does not guarantee any significant rise of earning, compared to lowly educated ones. In spite of participating more trainings, future orientation and personal traits seem to contribute to training effectivity for workers of any level of earning.

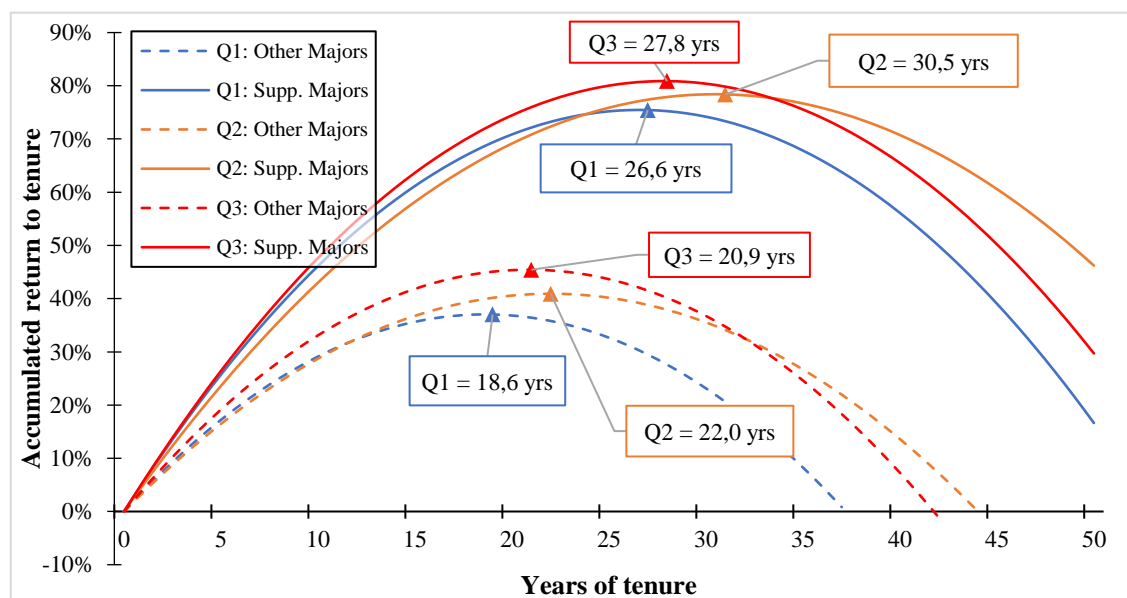
How job tenure and graduating from certain college majors affect workers career?

Job tenure is found to have non linear effect on workers earning. The estimation as shown in Table 1 with significantly negative coefficient of exp^2 implies a diminishing return to job tenure (RTT) in all levels of earning and yields a reversed U-shape earning-tenure profile. It means that workers in Indonesian productive sectors may experience some rise and fall periods throughout their career.

However, since these sectors are formal, one may assume that the retirement age is around 55 or around 30-35 years of tenure for Indonesian setting. Our calculation

(illustrated in Graph 3) shows that it could take 18-31 years of tenure for the workers earning to potentially rise. Regarding the moderation effect, we find that $dSuppEduc$ coefficients are positive, meaning that graduating from engineering, economic and science college majors results in significant increase of accumulated RTT and longer period of increase in earning. Workers who graduate from such college majors would obtain an increasing earning in 7-9 years longer than those who graduate from other majors. In fact, there is almost zero probability for workers with special education to experience drops of earning before the retirement age. This implies that achieving high education in these majors may potentially lead to better career in Indonesian most productive sectors.

This result clarifies the findings of Suhardan, Riduwan & Enas (2012) that graduating from these majors has been giving the largest individual benefit for Indonesian workers since the last three decades. This also carry out the suggestion given by Cho, Kam, & Lee (2017) about measuring the effect of college majors on human capital supply.



Graph 3. Estimated earning profile and educational moderation effects

Note: *supp. majors include engineering, economics and sciences*

How demographic aspects affect workers career?

Male sex ($dSex$) is found to moderate significantly the non linear RTE for the lower and middle-earning workers. For both groups, male workers seem to benefit more from completing compulsory and postsecondary educations with greater earning than females. Meanwhile, women workers have the opportunity to more closely align their earning to that of males if both have completed middle-high education. For the higher-earning group, the nonlinear moderation of sex to RTE is rejected. Therefore by using linear estimates (see Table A1 – Appendix), we find that male sex moderates negatively the RTE. It means the earning of highly educated female and male workers are more competitive in highly paid jobs. This clarifies the finding of Wahyuni and Monika (2016) which suggest to improve the formal education participation and attainment for Indonesian females in order to achieve gender economic equality in human capital.

We also highlight the marginal effect of age on earning, with the coefficient of age^2 in Table 1 is found to be negative. Therefore, the age-earning profile of Indonesian

productive workers would be convex like most have found in earlier studies. From the estimates, we predict the peak earning is reached at the age of 39-40 years for lower and middle earning workers and at age of 43 years for high-earning worker. What could be implied from it is how human investment either by public or industries become fruitful when targeted to workers under the peak age.

As the nature of productive industries which usually set up in more infrastructural areas, living in urban areas results in earning advantage of 5.8 to 16.2 percent compared to living in rural areas. Marital status accounts for 9.2 percent of the earning increase of middle-earning workers.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

We begin this study by investigating the nonlinearity in the RTE and job tenure by using a modified wage function. We also attempt to identify some possible moderators that may affect the non-linear return to both variables based on empirical results of previous studies and demographic situation of Indonesia. We draw our attention to investigate participating in the job training, male sex and vocational schooling as the moderators for education and graduating from certain college majors as the single moderator for job tenure.

The first main result of this study shows that the RTE is non-linear with significant moderations by job training participation and male sex within some earning levels. However, the nonlinearity of RTE emerges with three major problems identified. First, we find that the RTE of academy is negative. Secondly, we find that postgraduate education is contraproductive with job training participation. Third, we cannot calculate any significant moderation of vocational schooling to the RTE.

We believe that the three problems are potentially the tips of the same iceberg. The systemic defects in the orientation and quality control of Indonesian vocational education in high and higher levels and formal training have led to lack of qualification demanded and job market signaling for its graduates, resulting in mismatch between knowledge and career. In the end, investment in vocational, academy education and formal general training become less attractive for Indonesian society.

Public-private connectionship has long become a discourse to enhance human capital of vocational school students and graduates. This has to be pursued along with a systemic restoration and improvements in Indonesian vocational education to address future challenges. In the current era of industrial revolution 4.0, young people are demanded to have the following skills: complex problem solving; critical thinking; creativity; people management; coordination ability; emotional intelligence; judgement and decision making; service orientation; and cognitive flexibility (van Dam, 2017). Such skills are probably difficult to acquire with the current quality of job training and vocational education available in Indonesia. Therefore, the development of middle-high education should be driven toward achieving a new national standard for youth agers, from graduating-score oriented to skill-oriented.

Demographical set of aspects including sex, place of living and marital status still play important roles in determining the earning of Indonesian workers in productive industries despite the sign of losing its power on high-earning workers. Therefore, earning disparities seems to still emerge in near future until some structural revolutions especially those that concern with human investment take place in Indonesian social life and infrastructure development.

Recommendations

In order to make effective the investment of human capital for the future workers of Indonesian productive sectors especially for those who graduate from SMK and academy, we recommend that specific, industry-responsive job training as well as vocational sciences should be more provided for high school fresh graduates with regards to Indonesian regional specialisations. Not only to develop the competitiveness in Indonesian productive sectors, the policy should improve to whole economy. The vocational skill acquisition by schooling or training should utilize various media including long distance learning and actively qualified certification. Scholarships and researches should also be promoted more to developing the human capital of Indonesian teenagers.

The second main result of this study shows that workers career is quite promising in these sectors where the earning increment periods last relatively long (around 30 years). We find that studying in engineering, economics and sciences college majors significantly increase the increment periods and the amount of earning. Therefore, we recommend that the government should invest in developing these college majors by promoting research programmes and global competitions, providing more scholarships and strengthen the connectivity between colleges, industries and society fund raisers. Most importantly, the public investment should also be devoted in order to restore the labor market competitiveness of middle-high vocational education especially in these majors. The government should attract productive private firms by offering special incentives (for instances: tax relief) if participating the partnership in establishing industry-specific vocational schools.

From earning level point of view, a protective policy recommendation should be arranged mostly for lower-earning workers. From the result of this study, completing higher education should be a general suggestion to enhance human capital stock for lower earning workers. To sustain the RTE of these workers, it is necessary to provide them with sectoral training programs which encourage their willingness, personal traits, future expectations and experience beside achieving higher degrees in schooling. Meanwhile, the higher-earning workers seem to have larger opportunity to sustain or enhance their lifetime earning by investing more in postsecondary education. This should be assisted by public and industries investment in providing sectoral scholarships to prepare expertise capabilities for accomplished workers.

Lastly, concerning our methodology in this study, it is very natural that our efforts to reveal a typical return to human capital of particular Indonesian workers need to be improved in many other aspects. We strongly recommend to investigate the dynamics of Indonesian human capital by using non-parametric methods so the research can totally escape from the rigid determination of factors involved in statistical model. In the era of big data where the capacity of statistical institution in providing richer data has gradually improved and the development of data science algorithm, one's interest to discover the unrevealed factors and interactions among human capital aspects would likely meet the goal.

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APPENDIX

Table A1. Basic/linear quantile estimates (Mincer's)

Variables	Coefficient (standard error)		
	Q1 (0,25)	Q2 (0,5)	Q3 (0,75)
const	10,973 (0,208) ^{***}	12,088 (0,133) ^{***}	12,629 (0,194) ^{***}
sch	0,139 (0,010) ^{***}	0,113 (0,006) ^{***}	0,088 (0,009) ^{***}
dTrai	0,131 (0,209)	0,229 (0,133) [*]	0,518 (0,194) ^{***}
dSex	1,355 (0,126) ^{***}	0,961 (0,080) ^{***}	0,555 (0,117) ^{***}
dTrai×sch	0,009 (0,015)	-0,001 (0,010)	-0,020 (0,014)
dSex×sch	-0,081 (0,010) ^{***}	-0,060 (0,006) ^{***}	-0,034 (0,009) ^{***}
dVoc×sch	-0,003 (0,004)	-0,002 (0,003)	-0,002 (0,004)
exp	0,045 (0,008) ^{***}	0,034 (0,005) ^{***}	0,042 (0,007) ^{***}
dSupMaj×exp	0,023 (0,005) ^{***}	0,023 (0,003) ^{***}	0,022 (0,005) ^{***}
exp2	-0,001 (0,000) ^{***}	-0,001 (0,000) ^{***}	-0,001 (0,000) ^{***}
age	0,056 (0,010) ^{***}	0,037 (0,006) ^{***}	0,048 (0,009) ^{***}
age2	-0,001 (0,000) ^{***}	0,000 (0,000) ^{***}	-0,001 (0,000) ^{***}
dLoc	0,136 (0,040) ^{***}	0,171 (0,026) ^{***}	0,077 (0,037) ^{**}
dMar	0,007 (0,053)	0,107 (0,033) ^{***}	0,029 (0,049)
pseudo-R²	0,205	0,234	0,233

Source: author's calculation

Notes: ^{***}; ^{**}; ^{*} significant at 1%; 5%; 10%

Table A2. OLS estimates

Variables	Coefficient (standard error)	
	Full spec.	Basic spec.
const	12,170 (0,168) ^{***}	11,885 (0,153) ^{***}
sch	0,042 (0,018) ^{**}	0,108 (0,007) ^{***}
dTrai	0,218 (0,339)	0,330 (0,153) ^{**}
dSex	0,795 (0,120) ^{***}	0,922 (0,093) ^{***}
max(sch – 9,0)	0,159 (0,050) ^{***}	
max(sch – 12,0)	-0,041 (0,046)	
max(sch – 16,0)	0,225 (0,238)	
dTrai×sch	0,016 (0,042)	-0,005 (0,011)
max(sch – 9,0)×dTrai	-0,030 (0,072)	
max(sch – 12,0)×dTrai	-0,035 (0,050)	
max(sch – 16,0)×dTrai	-0,362 (0,173) ^{**}	
dSex×sch	-0,009 (0,019)	-0,051 (0,007) ^{***}
max(sch – 9,0)×dSex	-0,130 (0,053) ^{**}	
max(sch – 12,0)×dSex	0,101 (0,048) ^{**}	
max(sch – 16,0)×dSex	0,220 (0,198)	
dVoc×sch	0,000 (0,004)	-0,004 (0,003)
exp	0,047 (0,006) ^{***}	0,046 (0,006) ^{***}
dSuppMaj×exp	0,015 (0,004) ^{***}	0,024 (0,004) ^{***}
exp2	-0,001 (0,000) ^{***}	-0,001 (0,000) ^{***}
age	0,046 (0,007) ^{***}	0,046 (0,007) ^{***}
age2	-0,001 (0,000) ^{***}	-0,001 (0,000) ^{***}
dLoc	0,124 (0,029) ^{***}	0,142 (0,029) ^{***}
dMar	0,042 (0,038)	0,028 (0,039)
R² (adj-R²)	0,409 (0,404)	0,393 (0,390)

Source: author's calculation

Notes: ***; **; * significant at 1%; 5%; 10%

Table A3. Statistics for productive sectors in Indonesia

No	Economic Sector	Productivity (Rp. million per worker)	Average wage (Rp)	Output* (Rp. Trillion)	Output rate* (percent per year)
1	Agriculture	44.18	1,655,121	1209.7	3.25
2	Mining and excavation	608.19	4,197,869	775.5	1.06
3	Manufacturing	160.29	2,353,052	2017.6	4.29
4	Gas and electricity	549.89	3,370,398	100	5.39
5	Water and waste management	37.01		7.6	3.6
6	Construction	161.39	2,397,089	925.1	5.22
7	Trade and reparation	75.9	2,128,768	1,255.20	3.93
8	Acommodation and restaurant	57.94		282.2	4.94
9	Transportation and warehousing	130.2	3,198,413	375.8	7.74
10	Information and communication	657.12		459.2	8.87
11	Financial services	300.98		378.2	8.9
12	Real estate	979.06	3,677,156	278.5	4.3
13	Company services	147.23		159.3	7.36
14	Government/public/military services	95.99		320	3.19
15	Educational services	68.73	2,682,886	293.9	3.84
16	Health services	75.53		102.3	5
17	Other services	42.4		156.2	7.8
Total		4192.03	2,555,962	9096.3	-

Compiled from: (1) BPS – Laporan Perekonomian Indonesia 2017

(2) BPS – Statistik Indonesia 2017

Note: *GDP in constant prices of 2010

Table A4. Average and quantile earning for all schooling levels

No	Schooling level	Average	Q1	Q2	Q3
1	Not attending school/not graduating SD	1,456,000	700,000	1,200,000	1,920,000
2	Elementary school (SD)	1,677,805	900,000	1,500,000	2,000,000
3	Junior high school (SMP)	2,246,453	1,200,000	1,800,000	2,800,000
4	General senior high school (SMA)	2,940,211	1,500,000	2,500,000	3,500,000
5	Vocational senior high school (SMK)	2,900,151	1,500,000	2,400,000	3,800,000
6	Academy/baccalaurate degree	4,211,777	1,500,000	2,400,000	3,800,000
7	University/bachelor degree	5,629,900	3,000,000	4,000,000	6,000,000
8	Postgraduate/master and doctoral degrees	12,425,000	5,000,000	8,900,000	12,500,000
TOTAL		3,251,667	1,500,000	2,400,000	3,800,000

The suitability of cryptocurrency in the structure of Islamic banking and finance

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Abstract

This paper tends to examine cryptocurrency and its permissibility in the structure of Islamic banking finance. It identifies the major types of cryptocurrencies and also revealed its benefits. Despite these benefits and relating it to Islamic finance it was viewed from two angle; cryptocurrency and money in Islam and also cryptocurrency and the principles of Islamic finance. The study revealed it is compatible to structure of Islamic banking and finance when compared side by side to the features of fiat money which is currently in use. More so, the study clears some of the key issues like its legal tender, issuer unknown, money laundering & illicit purpose etc usually raised against cryptocurrency. The study concluded that cryptocurrency as an economic innovation has secured a pass mark to fit into the structure of Islamic banking and finance. The study further recommends that there is need to create standards guiding its operations, further ensure full disclosure on its transactions etc.

Keywords: *Cryptocurrency, Islamic banking & finance, Economic innovation, Legal tender.*

JEL classification: E42, G21, O31

INTRODUCTION

“No Nation or Individual is an Island”, thus the need for trade to take place amongst individuals or nations in order to ensure continued survival. In the traditional economies, the barter system of exchange was adopted but due to its shortcomings such as the problem of double coincidence of wants, it lack standard of deferred payment, common measures and store of value etc the modern form of currency was introduced. Currency (from Middle English; *curruant*,” in circulation”, from Latin; currency: *currens, -entis*) is more particular to money and this refers to a commonly accepted form of money (i.e., banknotes and coins) issued by the government (monetary authorities) which serves as a medium of exchange or for the payment of debt.

The introduction of currency tends to alleviate the hitches encountered during in the barter system. Currency can be categorized into two (2) monetary systems namely; Fiat and Commodity Money which depend on what guarantee the value. More so, some currencies are seen as legal tender in some political jurisdiction whereas others are exchanged for their economic value. However, as time evolves and with the increasing use of computer and internet, innovation into various areas gave rise to the advent of a

new type of currency called Digital Currency which is also referred to as cryptocurrency. This type of currency is now gradually permeating the financial landscape of different economies of the world.

Cryptocurrency is a digital asset designed to work as a medium of exchange which uses cryptography to secure its transaction in order to control the creation of additional units and to verify the transfer of asset (Wikipedia, 2018a). Cryptocurrency or cryptography emanated from a Greek word “*Kryptos*”-Hidden Secret and “*Graphein*”-to write. This involves the practices and study of methods to protect communication in the presence of third parties called adversaries.

The origin of cryptocurrency can be traced to Satoshi Nakamoto, a Pseudonymous developer in 2009 when she created Bitcoin. This form of cryptocurrency uses SHA-256 a cryptographic function as its evidence of work scheme. Since then different categories of crypto currencies have emerged. Cryptocurrency is further referred to as *altcoin* (i.e alternative coin). This form of currency control structure is decentralized in nature as opposed to the centralized electronic money and central banking system. Under this arrangement every transaction is digitally recorded in blocks. These blocks act like ledgers and once a block is used to capacity a new block is created. All blocks are connected to each other via hash tag (i.e., time stamping of transaction) based on evidence of work. These blocks are in linear chronological sequence which is called Block chain.

Currently, cryptocurrency have a market capitalization of about \$800 billion which is just 0.3% of \$215trillion in the total asset globally. (Investopedia, 2018). Despite this huge market capitalization and investor craze to invest their funds, it still has some contending issues regarding its adoption by certain economies of the world. This has further raises question on whether or not, cryptocurrency fits into the parlance of Islamic banking and finance? It is in lieu of this question that the following objectives were developed; to examine the various types of cryptocurrencies, to compare money (fiat) and cryptocurrency, examine the relationship between cryptocurrency and the principles of Islamic banking and finance and to examine some of the contending issues raised about cryptocurrency.

LITERATURE REVIEW

Cryptocurrency

The European Central Bank (2015) defines virtual currency or cryptocurrency as digital representation of value that is neither issued by a central bank or a public authority, nor necessarily attached to a fiat money or currency, but is accepted by natural or legal persons as a means of payment and can be transferred, stored or traded electronically.

There are about 1,348 types of cryptocurrencies that are available over the internet (Wikipedia,2018b). Though, it's not exhaustive as it keeps growing. However, we shall briefly discussed the major types of cryptocurrencies such as Bitcoin, Litecoin, Ethereum, Zcash, Dash, Ripple and Monero.

Bitcoin (BTC) is considered as the first cryptocurrency that emerged in 2009. It is based on peer to peer electronic payment system and a solution to the problem of double spending (Nakamoto,2008). It is premeditated basically to reduce the need of a financial institution or trusted third parties entities and it is based on SHA-256 algorithm. This form of cryptocurrency function as physical cash since its character is a bearer of e-cash and its transfer are irreversible. Bitcoin can be splitted around 8 decimal places and

could be extended further if need arise. In other words, a single bitcoin can be spent at a fractional increment that can be as small as 0.0000001 BTC per transaction. This increment is called *Satoshi* which was named after the author. Currently, the market capitalization of bitcoin stood at \$277billion as at Jan'2018 (Empirica,2018) which is considered as the highest amongst other cryptocurrencies.

Litecoin (LTC) was launched by Charles Lee in 2011. It is considered as silver to Bitcoin gold. This form of cryptocurrency makes use of script encryption algorithm which is contrary to SHA-256 adopted by bitcoin. This can be translated or decoded with the help of CPU of consumer grade. In other words, with the help of its cryptographic algorithm, like ASIC (Application-Specific Integrated Circuit Chips) it makes the block generation 4x faster. Currently, litecoin market capitalization stood at \$13.7billion as at Jan,18 (Empirica,2018).

Ethereum (ETH) is a non centralized software platform that enables smart contracts and distributed application (DApps) to built and run without any downtime, fraud, control or interference from a third party (Wikipedia,2018a; Empirica,2018). It was launched in 2015. Ethereum is run on its platform specific cryptographic token called Ether. This platform is to use to codify, decentralize, secure and trade just about anything. It is splitted into two (2); Ethereum and Ethereum Classic (ETC). It currently has a market capitalization of About \$98.3billion at Jan'18 (Empirica,2018).

Dash was formerly known as Darkcoin. It is very secretive in nature. Dash operates on a non centralized master code network that makes it difficult to trace its transactions and it can be mined using a CPU or GPU. This form of cryptocurrency was developed by Evans Duffield and it was launched in 2014. Though, in 2015 the concept was re-branded to Dash which means digital cash. This name change did not change its features like Darksend, InstantX etc (Investopedia,2018). Currently, it has a market capitalization of about \$9.6billion at Jan'18 (Empirica,2018).

Ripples (XRP). This form of cryptocurrency was launched in 2012. It has a network that is real time world settlement which enables it to offers instant, certain and low cost international payments. This system has a consensus ledger and as such it does not require mining which is seen as a distinguishing feature from the bitcoin and altcoins (Investopedia,2018). Consequently, it reduces the usage and computing power and minimizes network latency. It is against this background that such cryptocurrency is backed by many banks and financial institutions. Currently, its market capitalization stood at \$120b which is considered as the 3rd most capitalized cryptocurrencies as at the end of Jan'2018 (Empirica,2018)

Monero (XMR). This was first launched in April, 2014. It is a secured, private and untraceable currency. This type of cryptocurrency is entirely donation based and community driven (Investopedia,2018) which applies a unique technique called Ring Signature and with such a technique, there seems to be a bunch of cryptographic signature like at least one real player but since all of them appears valid, the real one cannot be isolated. Currently, its market capitalization stood at \$6.1b which is considered as the as at the end of Jan'2018 (Empirica,2018).

Zcash. This form of cryptocurrency is decentralized in nature and it was first rolled out in 2016. Zcash is https as it gives additional privacy or security where all transactions are documented and printed within a block chain. In Zcash, the details of the sender, amount, recipient remains private. This is achieved because its content are encrypted via the use of sophisticated cryptographic procedure or zero knowledge proof

structure which is referred to as ZK-SNARK. Currently, its market capitalization stood at \$1.7b which is considered as the as at the end of Jan'2018 (Empirica,2018).

Islamic banking and finance

Kamar *et al* (2015) sees it as the provision of financial services in accordance with the Islamic jurisprudence (*Shariah*). The *Shariah* is also known as *Fiqh Al-Mu'amalat* (Jurisprudence of Commercial transaction). The rules and practices of *Fiqh Al-Mu'amalat* emanated from the Quran and the Sunnah, and other secondary sources such as opinions collectively agreed among *Shariah* scholars (*ijma*), analogy (*qiyas*) and personal reasoning (*ijtihad*).

The principles of Islamic finance are as thus:-

Prohibition of interest: This implies that any return over and above the actual loan amount which is predetermined is prohibited. The prohibition of interest derives its source from both the Holy Quran and the Sunnah of the prophet. The Holy Quran (Q2:278) states that,“ *“O believers fear Allah and give up what is still due to you from interest (Usury), if you are true believers”*. Similar, prohibitions can also be found in 2:275,276 and 3:130 etc

Profit & loss sharing: Islamic banking and finance is based on the principle of profit and loss sharing which depicts a divergence from the conventional form of banking and finance. This means that lender and the user of the funds must share in the profit or loss from the investment/venture for which the money was lent according to the agreed ratio or capital contribution if funds are invested under the *Shirkah* agreement. This principle discourages one to be a creditor. The fundamental juristic rule in the *Shariah* that informs the idea of risk-sharing states: “*al ghunm bil ghurm,*” meaning “there is no return without risk.”

Gambling (maysir), uncertainty/speculation (gharar) are prohibited: Islamic banking and finance prohibits transaction involving gambling. As it is clearly spelt out in the glorious Quran, in Suratul Maidah which states that:-*“O you who believe! Intoxicants (All kinds of alcoholic drinks) & gambling & Al-ansab and Al-Azlam (arrow for seeking luck of decision) are abomination of shaitan (Satan) handiwork. So avoid (strictly all) that abomination in order that you may be successful. (Q5:90)*. This principle also demands that any contract entered into should be freed from doubt risk and speculation. In otherwords, parties involved should have an in-depth knowledge of the transaction dynamics.

Unethical business or investment is prohibited: Islamic banking and finance is based on the principle which prohibits investments in unethical businesses or prohibited commodities. That is it only supports practices or products that are in line with the *shariah* law. For example trading in alcohol, pork is prohibited as stated in Suratul Maidah 5:3.

METHODOLOGY

This study was conducted based on review of related literatures. This information was sourced from different reports, text, articles and other sources as it relates to cryptocurrency and Islamic banking and finance. The study further lay more emphasis on Bitcoin in its analysis taking into cognizance that it is the oldest and popular form of cryptocurrency.

RESULTS AND DISCUSSIONS

Cryptocurrency, Islamic banking and finance

In order to establish the permissibility of cryptocurrency in Islamic banking and finance it is cogent we briefly discuss the concept of Money in Islam and comparing it to cryptocurrency.

Money

Money refers to anything that is generally acceptable as a medium of exchange and for the settlement of debts.. Money has the following features such as :- a medium of exchange, standard for deferred payment, measure of value, portability and unit of account.

However, Jurists and scholars have dissected money into two variants: Natural money and customary money. Natural money is a type of money which has monetary value and it is created to serve as a medium of exchange. In other words, it has intrinsic value. Example of natural money includes gold and silver where as customary money refers to a type of money which gets the position of money due to custom and acceptability of people. Customary money is not created to serve for the purpose of money, but people accept it widely to use as medium of exchange.

Subsequently, customary money can be further splitted into two types: commodity money and fiat money. The commodity money has natural value and can be used for additional purposes while a fiat money is a paper currency which is issued by the governments (monetary authorities); it neither has natural value nor natural moneyness as its value is determined by the government.

Money (fiat) and cryptocurrency

Islam considers commodities with intrinsic value as currency. However, during the life time of the prophet, the following commodities were used as currency, Gold (as Gold Dinar), Silver (as silver Dinar), rice, dates, wheat, barley and salt. Gold and Silver were explicitly mentioned in the Quran 3:14 but because of it limited supply other commodities as earlier mentioned was used.

However, Imran Hosein, identifies six (6) common traits that captures the definition of money in Islam (Barker,2013). These are as thus: Money is either precious metal or food, Money is abundant and freely available, Money is durable and does not spoil or corrode, Money has intrinsic value, Money exist in creation and is made valuable by God, Money functions as a medium of exchange.

We shall further relate these features to that of the cryptocurrency to ascertain whether or not it best fit into money in Islam. Firstly, Money is either precious metal or food. This criterion best suits the earlier mentioned commodities (Gold, Silver, dates, rice, dates, wheat and barley) that were used as currencies during the era of the prophet. However, as time evolves this quality could not stand the test of time due to its limited supply and other hinges involved in its exchange which lead to the emergence of fiat money and electronic money. Consequently, Cryptocurrency does not seem to match this quality taking into cognizance the context this feature of money was presented.

Secondly, Money should be abundant and freely available. Cryptocurrencies adequately fit into this quality as it is available in different forms such as bitcoin, litecoin, Etheurem etc around the world without international restriction when compared to the fiat money. This is because it is online in nature, hence makes it available. Therefore, cryptocurrency is abundant, available and exchangeable in any part of the world.

Thirdly, Money is durable and does not spoil or corrode. Cryptocurrencies best fit into this feature as it is durable in nature. Taking into cognizance that it does not exist in physical form just like the bank notes and coins, it cannot be damaged. More so, its mode of storage gives it an edge against other form of currencies. It can be stored in hardware wallets, Desktop wallet, fiat wallets, mobile wallets and online wallets. Thus, by its nature every cyptocurrency is eternal.

Fourthly, Money has intrinsic value. By this feature cryptocurrency tend to also fit into this feature. By intrinsic value we refer to as the true value, fundamental value. In commodity money, the intrinsic or natural value can be partially or entirely due to the attractive features of the object such as a medium of exchange and a store of value. In addition, the cryptocurrencies has intrinsic value when compared to fiat money because the value of the latter is determined by the central authorities or planners. Therefore, it is the people that made cryptocurrency to have value due to one reason or the other not the government or central planner which is on the same position with that of gold. Consequently, cryptocurrency is backed by itself and not backed by the state law. This scenario of fiat money contravene the Quranic principle of mutual consent (al-nasai: 29¹) in transactions as the people are compelled to give up part of their properties against fiat money which has no intrinsic value.

Fifthly, Money exists in creation and is made valuable by God. Cryptocurrency tends to satisfy the first part of this feature (i.e money exist in creation) which is also associated with other forms of currencies like Gold, Silver, dates, rice, dates, wheat and barley as they all require the activities of man to discover its value. The second part of the qualities made valuable by God. This feature embraces its inherent value and not value created and assigned by man as obtainable with the fiat money. Cryptocurrency also fit in to this quality technically because its value is not pegged by the central authorities i.e. people are forced to value it instead of the people to value it due to their own unique reasons and which is further determined by the forces of demand and supply.

Lastly, money functions as a medium of exchange which implies that it can be used for exchanged of goods and services. Cryptocurrency adequately fit into the feature of money in Islam because it is now accepted and used for exchanges. For instances Microsoft and Dell accepts BTC for their products. Airline such as AirBaltic and Air Lithuania accepts BTC for purchase of tickets. In addition, it is also used to pay bills, hotels, buy properties, buying gift etc. For instance, there are over 150,000 merchants globally that accepts bitcoin and the number in increasing every month (CoinDesk Research,2016)

Therefore, it is clear that cryptocurrency fit into five (5) qualities of money in Islam even when compared to fiat money which satisfies two (2) to three (3) qualities. Logically, it can be deduced that cryptocurrency is more Islamic in nature when compared to fiat money despite that fact that the latter is widely used by both Muslim and non Muslim countries.

Suitability of cryptocurrency to the principle of Islamic banking and finance

Having x-rayed cryptocurrency by its nature which satisfies a first order condition (i.e., as money in Islam). It is also pertinent to further relate it against the principles of Islamic finance to ascertain whether or not it satisfies the second order condition.

¹ O you who have believed, do not consume ones anothers wealth unjustly but only (in lawful) business by mutual consent. And do not kill yourselves (or one another). Indeed, Allah is to you ever merciful

Cryptocurrency, have little or no level of *gharar* and *maysir* when compared to fiat money. This is owing to the fact that Islamic scholars have stressed that any form of payment should be free from *Gharar*. *Gharar* is generally interpreted as risk, hazard or uncertainty. In other words, it refers to deception based on the absence of information or the doubtfulness of delivery with the prospect of causing damage.

Cryptocurrency is more certain and not deceptive because parties involved have adequate knowledge of the market and the product. Also, it is more transparent because every single transaction is being stored in a massive circulated public ledger called the Blockchain (Cointelegraph, 2018). Therefore, when compared to fiat money which has a high risk level, it contradicts the principles of Islamic banking and finance. This can be wrapped up in the words of Anwar and Haque (1993) that fiat money is an innovation whereby government extracts resources from the people. Issuance of fiat money itself is contrary to Islamic justice as it entitles the issuing authority to steal commodities belonging to the people. The Quran clearly prohibited such transactions declaring them as unjust (Q2:188).

Fiat money due to its high level of *gharar* components, It breeds inflation especially the demand pull inflation (i.e. more money chasing fewer goods) which end up making such a fiat money to lose its value. In other words, if fiat money is continuously been printed, at little cost, by the state, this invariably, it could further lead to inflation, given the continued addition of more and more paper money into the monetary system thereby weakening the value of the said currency (Muedini, 2018) where as cryptocurrency tends to be deflationary in nature as compared to gold and other commodities which can serve as hedge tool. For instance, the hyperflation faced by Zimbabwe or Venezuela results to loss of value of their currency which they reverted to gold and other precious commodities to preserve their wealth which cryptocurrencies will suffice.

By and large as for a payment option, cryptocurrency tends to meet up with Islamic banking and finance. In the words of Mathew (2018) which he stressed that...as a payment network, bitcoin is *halal*. In fact bitcoin goes beyond what more conventional closed banking network offers. Unlike conventional bank network which uses private ledgers where there is no guarantee that the originator actually owns the underlying asset. Bitcoin guarantees with mathematical certainty that the originator of the transfer owns the underlying asset. Conventional banks operate using a fractional reserve which is prohibited in Islam. He further stressed that bitcoin is more *halal* than any currency in wide circulation today but probably still fall short of the strict and narrow definition of money in Islam. Modern sovereign currencies are based on debt with usury-this is strictly prohibited in Islam. Therefore all modern money is not *halal*. Bitcoin on the other hand is not based on debt-it is based on proof of work and at least not *haram*.

Cryptocurrency tend to conforms with one of the cogent principles of Islamic Banking and finance which is the prohibition of *riba* (usury) when compared to fiat money because in fiat money *riba* is inherent in it because it has the power to create its self without sufficient asset backing it up. Consequently, it keeps on creating infinite bubbles but with cyptocurrency most especially bitcoin, its quantity increases at an expected and a slow rate with its ceiling known to be 21Million units. Rather than the units of bitcoin being lent into existence at the whims of an individual, a new unit of XBTs is released in exchange for the provision of services to maintain the security and stability of the Bitcoin Network (Charles,2015).

Moreso, cryptocurrency also complies or incorporates the principles of risk sharings as oppose to risk shifting which is associated with the fiat money. This is against the background in which the Blockchain Management System is structured. It's a kind of *Musharakah- Musharakah* literally means Sharing. This refers to a relationship between two parties or more whom pool their resources together to a business based on an agreed profit or Loss ratio. Charles (2018) asserts that bitcoin operates according to *musharakah* in which the miners operate as general partners in loose confederation, who share the cost and benefits of maintaining the system. The greater the proportion to the total computing power in the system particular miner's investment is in equipment used to confirm transactions among users, the greater is that miners proportion of the XBT released by the system.

Clarification in issues of cryptocurrency

Most the criticism advanced by individuals, scholars etc to the permissibility of cryptocurrency can be summed as thus: Cryptocurrency is not a legal tender, cryptocurrency issuer is not known, cryptocurrency has no central authority or government backing it, cryptocurrency is extremely speculative and cryptocurrency is an avenue for money laundering and illicit activities.

Cryptocurrency is not a legal tender:

The issue that cryptocurrency has no legal tender which implies that it has no legal backing by the state is to be considered as a relative justification as there are some countries which Bitcoin for instance is legal. Among which are Australia, Bulgaria, Canada, Estonia, France, Germany, Iceland, Israel, Japan, Jordan, Mexico, Sweden Slovia etc. The major criterion for money in *Shariah* is its acceptability by people - whether it comes about by forcing it upon people via laws, or through voluntary acceptance of people (Abu-Bakar,2017).

Cryptocurrency issuer is not known/central authority

This is considered as a one of the major criticism of cryptocurrency that the issuer is not known and there are no monetary authorities to neither supervise nor guarantees it. However, it is pertinent to note that there exists a framework for the users of this type of currency which is fully disclosed for parties' consumption and taking into play that it adopts the block chain technology makes it more secured than the centralized system engaged by a government or central bank. More so, because of its cryptographic feature, it is mathematically unworkable to maneuver the laws and rules that govern its *modus operandi*. For example, the SWIFT network is widely used by banks as an inter-bank payment system. In February 2016, \$1 Billion USD was stolen from the Federal Reserve Bank of New York from the account of the central bank of Bangladesh (Wikipedia, 2018b)

Cryptocurrency is an avenue for money laundering and illicit activities.

The issue that cryptocurrency are used for money laundering and other illicit purposes does not make it to lose its way to be recognized as an acceptable form of currency. For instance fiat money (E.g US Dollars) are been used for similar purpose and it does not make the money to be illegal. In other words, using something lawful for an unlawful purpose does not make the thing itself unlawful. An example from the Hadith can be found in that the Prophet Muhammad (peace be upon him) forbade the selling of grapes to a wine merchant, since making wine is *haram* (impermissible), but did not forbid the production or trading of grapes for lawful purposes.

CONCLUSIONS AND RECOMMENDATIONS

Conclusion

Despite the fact that cryptocurrency is considered as an economic innovation it is gradually occupying the center stage of the financial landscape as investors are gradually considering it as channel of investment. Though, this digital currency might absolutely fit into the conventional system but in the case of Islamic financial system cautioned is needed due to its ethical nature. However, from the analysis presented, we can see that cryptocurrency is compatible to Islamic banking and finance because it best fit into the major qualities of money in Islam and the principles governing the operations of Islamic Banking and finance when compared to the fiat money.

Recommendations

The following are some of the recommendations to ensure that cryptocurrency is adopted into Islamic banking and finance; There is need for all stakeholders (Islamic scholars, shariah experts, AAOIFI, IFSB etc) in various economies to sit down on a round table to formulate standards in order to guide its entire *modus operandi* as this could go a long way to address the fears of users/investors.

More so, there is need for more transparency in terms of full disclosure on all their transaction/profile of user as this will go a long way to cleanse the system because it will no longer be a hiding place for criminals, drug traffickers. In addition as an investment option, its structure is making it difficult to be taxed, thus investor will automatically evade tax but with more disclosure, tax can be levied on their investment and also *zakat* can be calculated on their investment.

Lastly, there is also need to ensure that they operate a quazi-centralized system rather than a fully decentralized system as this will ensure that additional repository are created and this will be of immense benefit in case of data loss.

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The effect of inflation, US bond yield, and exchange rate on Indonesia bond yield

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Abstract

Indonesia sovereign bonds are investment graded bonds, therefore, it will have global exposure and it will be more interlinked with global market condition. The purpose of this research is to examine the impacts of US bond yield, exchange rate, and inflation on Indonesian bond yield. Our result conclude that based on Vector Error Correction Model there are long run causality from inflation, US 10 year bond yield, and USD/IDR exchange rate to Indonesia 10 year bond yield. There are also short-run causality from inflation and US 10 year bond yield to Indonesia 10 year bond yield. Based on impulse response function, Indonesia 10 year bond yield respond permanently to changes in US 10 year bond yield. Based on Granger causality we also reveal that inflation and US 10 year bond yield can cause Indonesia 10 year bond yield. US 10 year bond yield has a larger impact than inflation when it comes to affecting Indonesia 10 year bond yield.

Keywords: *Inflation, Bond yield, Exchange rate, Government bonds*

JEL classification: E44, G23

INTRODUCTION

Indonesian government requires a lot of funds to fulfill public services. The gap between government revenue that derived from tax and government expenditures will leads to budget deficit. This deficit on government budget resulted in the needs to seek financing by issuing government bonds.

Since May 2017, for the first time since the Asian financial crisis 1998, Indonesia's government bonds are rated investment grade by all three major credit rating agencies, S&P, Moody's, and Fitch. It means global fund managers will watch Indonesian market closely, especially its sovereign bond market. Investment grade also means Indonesian financial market condition will be more interlinked with global market condition.

Spillover from US financial markets to domestic sovereign market has been studied by various researchers. Hsing (2015) in Spain revealed that the Spanish government bond yield is positively associated with the US 10 year government bond yield. By using impulse response function to measure shock effects from the US government bonds term premium to Latin American government bonds term premia, Espinosa-Torres et al. (2016) found that the responses are larger for Brazil and Colombia whereas Mexico shows the lowest responses.

Impact of The Fed tapering from its quantitative easing on emerging markets also has been emphasized by some researchers. Fong, Li, & Sze (2016) revealed that there are spillovers between the US and emerging markets because of US monetary tightening such as tapering off quantitative easing by The Fed. Belke, Dubova, & Volz (2016) found that

government bond yields in emerging Asia affected significantly by changes in the United States and Eurozone bond yields. Various global external shocks such as volatility index, fuels, 3 month treasury bills, credit default swap, gold price, and Brent oil are very significant in determining bond yield in emerging market (Akinsola, 2018).

Inflation rate affect how much real interest will be received from the coupon as Fisher (1930) argued that the real interest rate equals the nominal interest rate minus the expected inflation rate. Hsing (2015) revealed that the Spanish government bond yield is positively associated with the expected inflation rate. Schaeffer & Ramirez (2016) examined co-movement of European sovereign bond yields and they concluded that the yields move together over time and inflationary shocks are transmitted quickly from country to country in Europe. Ouadghiri, Mignon, & Boitout (2015) found that by using intraday data as an event study, the main bond market mover is based on inflation indicators.

Exchange rate is suspected to be the main catalyst in determining bond yield. Arshad, Muda, & Osman (2017) found that in the long run, there is a strong relationship between oil prices and exchange rate on the yield of sovereign bond and sukuk in Malaysia. Gadanecz, Miyajima, & Shu (2014) found that yield as compensation for holding emerging market local currency government bonds depend on the exchange rate volatility. The impact of exchange rate volatility become higher since 2013 when Federal Reserve started to taper its quantitative easing.

Based on the literature review as we stated before, there are various research about how inflation, US bonds market, and exchange rate will affect bond yield in emerging market. However, in Indonesia research about that topics are very limited. Yuliawati & Suarjaya (2017) revealed that by using linear regression, inflation have an insignificant effect on bond yields. Manurung et al. (2017) found that Indonesia government bonds yield curve is determined by liquidity factors, macroeconomic factors, external factors, and market risk factors.

The aim of this research is to examine the impacts of US bond yield, exchange rate, and inflation on Indonesian bond yield. We do this research with the newest available data by using monthly data start from January 2009 to December 2018. We have novelty and scientific contributions from this research. First, there are no academic research about how US bond yield can affect Indonesia bond yield. Second, we use Vector Error Correction Model (VECM) as econometric tools that are the best model for these variables and go further with impulse response function and Granger causality under VECM environment.

METHOD

Vector error correction model (VECM)

In this research, a Vector Error Correction Model (VECM) is employed to investigate the complexities of the dynamic connections from US 10 year bond yield, inflation, and exchange rate to Indonesia 10 year bond yield. The regression equations of the VECM z_t for an $m \times 1$ vector of I(1) variables is as follows:

$$\Delta z_t = -\Pi z_{t-1} + \sum_{i=1}^{k-1} \Gamma_i \Delta z_{t-1} + d + \epsilon_t \dots \dots \dots (1)$$

Where k is the number of lags in the unrestricted Vector Auto Regression (VAR) representation of z_t , d is an m vector of deterministic terms, Π is restrictions on the rank of the long-run matrix, and Γ_i is restrictions on the short-run dynamic coefficients. A negative and significant coefficient of the VECM ($-\Pi z_{t-1}$) shows that long run relationship exists between independent and dependent variables.

Variables

All variables are monthly data from Januari 2009 to December 2018. The variables explanations are as follows:

Table 1 . Variables descriptions

Variable code	Description	Source
ID10	Indonesia 10 year bond yield	Investing.com
CPI	Consumer Price Index as a proxy of inflation	Bank Indonesia
US10	US 10 year bond yield	Investing.com
USDIDR	Exchange rate USD/IDR	Investing.com

From VECM, we analyze impulse response function and Granger Causality under VECM environment. Based on impulse response functions, we examine the interactive response between shock from CPI, US10, and USDIDR to ID10. In Granger Causality, we examine not only correlation among variables but also the causality among variables.

RESULTS AND DISCUSSION

Descriptive statistics

Before we conduct deeper analysis, we can gather some information based on descriptive statistics in Table 2. Besides we compute minimum, maximum, and average value of the variables, we also compute standard deviation of the variables based on its monthly return. We found that US10 is the most volatile variable with standard deviation 9.3% and CPI is the least volatile variable with standard deviation 0.5%.

Table 2. Descriptive statistics

Variables	Min	Max	Average	Std.Dev.
ID10	5.17	14.17	7.82	6.4%
CPI	71.09	112.09	91.44	0.5%
US10	1.45	3.84	2.48	9.3%
USDIDR	8508.00	15227.00	11452.63	2.4%

Source: Bank Indonesia, Investing.com (author’s calculation)

Stationarity test & lag selection

Stationarity test is a very important technique in time series analysis as time series data tend to have a unit root (its mean and variance are not constant). This phenomenon occurs because a trend in time series data is very common. We conducted the stationarity test based on Augmented Dickey-Fuller/ADF test. If the data has a unit root, it means the data has a trend or non-stationary. On the other hand, if the data does not have a unit root, it means the data does not have a trend or stationary. Null hypothesis of ADF test is the data has a unit root. Precondition of the VECM are variables must be non-stationary at level but when we convert all the variables into first differenced then they will become stationary. Or in other words, the variables must integrated of the same order.

Table 3 . Stationarity test

Variables	Level		Variables	First Differenced	
	Probability	Stationarity		Probability	Stationarity
ID10	0.0544	Non-stationary	ID10	0.0000	Stationary
CPI	0.9531	Non-stationary	CPI	0.0000	Stationary
US10	0.2682	Non-stationary	US10	0.0000	Stationary
USDIDR	0.9537	Non-stationary	USDIDR	0.0000	Stationary

Based on the ADF test in Table 3, the variables are non-stationary at level and stationary at first differenced or the variables are integrated of the same order.

Table 4 . Lag selection

Lag	SC	HQ	Lag	SC	HQ
0	26.56663	26.50894	5	17.53318	16.32154
1	16.01990*	15.73142*	6	17.93542	16.49299
2	16.35566	15.83639	7	18.25628	16.58307
3	16.70557	15.95551	8	18.75815	16.85414
4	17.21645	16.23560			

For lag selection, we use Schwarz information criterion (SC) and Hannan-Quinn information criterion (HQ) in Table 4. Based on SC and HQ, the most optimum lag for the model is lag 1. Therefore, we use lag 1 for this model development.

Johansen cointegration test

As a long-term relationship was expected from the variables, we conduct Johansen cointegration test. Rejection of the hypothesis at the 0.05 level.

Table 5 . Unrestricted cointegration rank test (trace)

Hypothesized No.of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.
None*	0.225955	60.31321	47.85613	0.0022
At most 1*	0.176776	30.09040	29.79707	0.0463
At most 2	0.053795	7.136185	15.49471	0.5619
At most 3	0.005167	0.611256	3.841466	0.4343

Table 6 . Unrestricted cointegration rank test (Maximum eigenvalue)

Hypothesized No.of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.
None*	0.225955	30.22282	27.58434	0.0224
At most 1*	0.176776	22.95421	21.13162	0.0274
At most 2	0.053795	6.524930	14.26460	0.5468
At most 3	0.005167	0.611256	3.841466	0.4343

Based on trace test and maximum-eigenvalue, there are two cointegrating equations for this model development. Therefore, we conclude that there is suspected long-term relationship between those variables.

VECM analysis

As there are two cointegrating equations, therefore, we use Vector Error Correction Model (VECM). The model for ID10 as a dependent variable is as follow:

$$\begin{aligned}
 D(\text{ID10}) = & C(1)*(\text{ID10}(-1) - 1.08875747496*\text{US10}(-1) - \\
 & 0.0001426538576107*\text{USDIDR}(-1) - 3.4510797025) + C(2)*(\text{CPI}(-1) + \\
 & 0.445066273945*\text{US10}(-1) - 0.00579108467585*\text{USDIDR}(-1) - \\
 & 26.3629659749) + C(3)*D(\text{ID10}(-1)) + C(4)*D(\text{CPI}(-1)) + C(5)*D(\text{US10}(- \\
 & 1)) + C(6)*D(\text{USDIDR}(-1)) + C(7)
 \end{aligned}$$

Overall, the model is reliable as R-squared is quite high at 28.75% and probability of F-statistics is very significant (below 5%). We can see that in C(1) or coefficient of cointegrating model, the coefficient is negative (-0.295118) and its corresponding probability is significant at 0.0014 which is below 0.05 significant level. We also call C(1) as error correction term or speed of adjustment towards equilibrium. Because C(1) is negative and significant, then we can say that there is a long run causality from CPI, US10, and USDIDR to ID10.

Table 7 . Model characteristics

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	-0.295118	0.090082	-3.276096	0.0014
C(2)	-0.030655	0.020245	-1.514215	0.1328
C(3)	-0.122968	0.108481	-1.133550	0.2594
C(4)	0.189417	0.093135	2.033781	0.0444
C(5)	0.443136	0.198435	2.233152	0.0275
C(6)	-8.74E-06	0.000192	-0.045527	0.9638
C(7)	-0.122033	0.051232	-2.381986	0.0189
R-squared	0.287469			
Adjusted R-squared	0.248954			
S.E. of regression	0.424319			
Sum squared resid	19.98514			
Log likelihood	-62.66871			
F-statistic	7.463796			
Prob (F-statistic)	0.000001			

Because there is only one lag, therefore, there is no need to do Wald test. We can see short-run causality directly from table x. Probability of C(4) or coefficient of CPI is 0.0444 and below 0.05 significant level. Therefore there is a short-run causality from CPI to ID10. Probability of C(5) or coefficient of US10 is 0.0275 and below 0.05 significant level. Therefore there is also a short-run causality from US10 to ID10.

Residual diagnostic

After having the model, the model is good enough if it passes residual diagnostic tests. There are three main residual diagnostic tests, namely serial correlation test, heteroskedasticity test, and normality test. The residual must have no serial correlation, no heteroscedasticity, and normally distributed.

Table 8 . Breusch-Godfrey serial correlation LM test

F-statistic	0.412550	Prob. F(1,110)	0.5220
Obs*R-squared	0.440901	Prob. Chi-Square(1)	0.5067

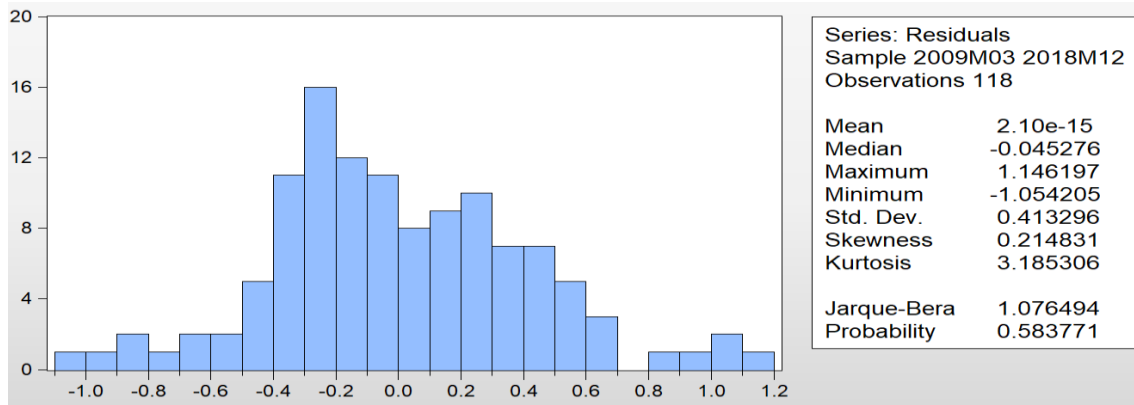
Null hypothesis of Breusch-Godfrey serial correlation LM test is there is no serial correlation. Based on the probability of Chi-Square we can see that the probability (0.5067) far beyond 0.05 level. Therefore, we accept null hypothesis, or there is no serial correlation.

Table 9 . Breusch-Pagan-Godfrey heteroskedasticity test

F-statistic	1.201161	Prob. F(8,109)	0.3051
Obs*R-squared	9.559927	Prob. Chi-Square(8)	0.2973
Scaled explained SS	9.243124	Prob. Chi-Square(8)	0.3222

Null hypothesis of Breusch-Pagan-Godfrey heteroskedasticity test is there is no heteroskedasticity. Based on the probability of Chi-Square we can see that the probability (0.2973) far beyond 0.05 level. Therefore, we accept null hypothesis, or there is no heteroskedasticity.

Null hypothesis of Jarque-Bera normality test is the residuals are normally distributed. Based on the probability we can see that the probability (0.583771) far beyond 0.05 level. Therefore, we accept null hypothesis, or the residuals are normally distributed.

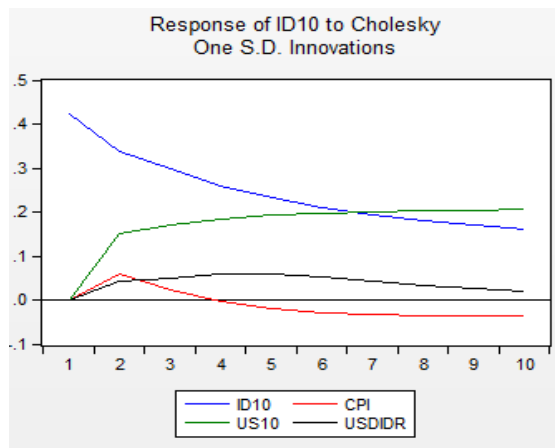


Graph 1. Jarque-Bera normality test

Because of the model passes all three residual diagnostic tests (serial correlation test, heteroskedasticity test, and normality test), we can say that the model is very robust. From the robust model, we can expand further into deeper analysis such as impulse response function and Granger causality test.

Impulse response function

One of the advantages of VECM is the capability to conduct impulse response function analysis. Impulse response function is a technique that can be used to determine the response of an endogenous variable from a shock from other variables. It also determine the length of the shock from one variable to the other variable.



Graph 2. Impulse response function

In impulse response function graph above, it is showed how if one standard deviation of shock of a variable will affect another variable and how it is developed over time. The interpretations are as follows:

- a) 1 standard deviation change of CPI increase 0.06 standard deviation of ID10 at 2nd period and then gradually decreasing until 0.035 standard deviation of ID at 10th period.
- b) 1 standard deviation change of US10 increase 0.15 standard deviation of ID10 at 2nd period and then gradually increasing until 0.21 standard deviation of ID at 10th period. In other words, ID10 respond permanently to changes in US10.
- c) 1 standard deviation change of USDIDR increase 0.06 standard deviation of ID10 at 4th period and then gradually decreasing until 0.02 standard deviation of ID at 10th period.

Granger causality test

From Granger causality perspective, if X Granger causes Y, it does not mean that X causes Y. It only means that X improves Y predictability. On the other words, Y can be better forecasted using the both X and Y than it can by using the Y alone.

Table 10 . VEC Granger causality (Dependent variable: D(ID10))

Excluded	Chi-sq	df	Prob.
D(CPI)	4.136264	1	0.0420
D(US10)	4.986969	1	0.0255
D(USDIDR)	0.002073	1	0.9637
All	9.130611	3	0.0276

We use Granger causality test under VECM environment. The interpretations are as follows:

- a) Null hypothesis of the test is D(CPI) cannot cause D(ID10) and alternative hypothesis of the test is D(CPI) can cause D(ID10). The probability value is 0.0420 which is less than 0.05 therefore we reject null hypothesis and accept alternative hypothesis that D(CPI) can cause D(ID10).
- b) Null hypothesis of the test is D(US10) cannot cause D(ID10) and alternative hypothesis of the test is D(US10) can cause D(ID10). The probability value is 0.0255 which is less than 0.05 therefore we reject null hypothesis and accept alternative hypothesis that D(CPI) can cause D(ID10).
- c) Null hypothesis of the test is D(USDIDR) cannot cause D(ID10) and alternative hypothesis of the test is D(USDIDR) can cause D(ID10). The probability value is 0.9637 which is more than 0.05 therefore we accept null hypothesis that D(USDIDR) cannot cause D(ID10).

Based on Granger causality we can see that CPI and US10 can cause ID10. However, US10 is more significant than CPI because based on the test, it has less probability value. On the other side, USDIDR cannot cause ID10.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

The aim of this research is to examine the impacts of US bond yield, exchange rate, and inflation on Indonesian bond yield. We examine the variables by using Vector Error Correction Model (VECM), impulse response function, and Granger causality. By using monthly data from January 2009 to December 2018, our result concludes that based on VECM there are long run causality from inflation, US 10 year bond yield, and USD/IDR exchange rate to Indonesia 10 year bond yield. There are also short-run causality from inflation and US 10 year bond yield to Indonesia 10 year bond yield. Based on impulse response function, Indonesia 10 year bond yield respond permanently to changes in US 10 year bond yield. Based on Granger causality we also reveal that inflation and US 10 year bond yield can cause Indonesia 10 year bond yield. US 10 year bond yield has a larger impact than inflation when it comes on affecting Indonesia 10 year bond yield.

This research shows that as an external factor, US 10 year bond yield has significant impact on Indonesia 10 year bond yield. This phenomenon occurs as Indonesia sovereign bonds are investment graded bonds. Therefore, global fund managers will closely watch and invest in Indonesian bond market. Fluctuation of the US bond market affects Indonesian bond market directly. The result of this research shows that Indonesian sovereign bonds market is more interlinked with global market condition.

Recommendations

Practical implications of this research are very useful not only for the investors but also for Ministry of Finance Republic of Indonesia as debt manager of the government. For investors, inflation and US 10 year bond yield will affect its return on investment. Whereas for Ministry of Finance, it will affect cost of debt in term of interest payment that has to be paid to bond holders and also cost of refinancing the debts. The stakeholders must emphasize at the fluctuation of US bond yield as an external factor and inflation as an internal factor.

Further research can be conducted to examine volatility spillover from advanced bond markets such as US, Japan, and Europe into emerging bond markets such as Indonesia. The method to examine volatility spillover is generalized autoregressive conditional heteroskedasticity (GARCH) model (Christiansen, 2007). From this method, we can find volatility transmission mechanism from advanced markets to emerging markets.

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Financialization, banking concentration and financial inclusion: the reproduction of structural heterogeneity in the financial complexes of Argentina and Mexico

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Abstract

The main objective of this paper is to analyze the behavior and dynamics of the banking sector in underdeveloped economies in times of financialization, using the cases of Argentina and Mexico. We argue that financialization has increased banking concentration and the participation of financial institutions *too big to fail* in the banking sector of underdeveloped countries. We start by analyzing some general statistics of the financial complex at the aggregate level and, later, we present a more concrete study on the behavior of the banking system in the two countries. We also develop a comparative analysis of access to financial services based on data from the World Bank. We found that the banking predominance has not been reflected in an increase in financial inclusion, but has exacerbated social inequalities, reconfiguring what is understood as underdevelopment in the 21st century. Given these adversities, we recommend that banks be more flexible when granting a loan to increase the financial inclusion of individuals.

Keywords: *Financialization, Banking, Financial inclusion, Underdeveloped economies*

JEL Classification: E44, G10, G21

INTRODUCTION

During the last half of the 1990s, the financialization of the economy, banking crises, financial deregulation and the globalization of financial services led to a significant increase in the entry of foreign banks into the banking sectors of underdeveloped economies. This great transformation in the banking sector intensified the level of concentration and deepened the competitive pressures among the periphery countries' banks. Despite the imminent presence of the banking sector, studies on financial inclusion in Latin America reveal that the region presents a low and heterogeneous level of access to financial services.

In recent literature, some authors with (neo) structuralist overtones argued that access to financial products and services necessary for the productive and social insertion of non-financial corporations and individuals should be considered a universal good (Cipoletta & Matos, 2018). However, the perspective of financial inclusion of ECLAC has a purely business dimension, that is, beyond focusing on increasing banking penetration and access to credit for households, visualizes financial inclusion as a type of industrial policy to promote productive insertion (Bárcena, 2018; Pérez & Titelman, 2018; Cipoletta & Matos, 2018).

This paper analyzes the behavior and dynamics of the banking sector in underdeveloped economies in times of financialization, using the cases of Argentina and Mexico. We argue that financialization has increased banking concentration and the participation of financial institutions *too big to fail* in the banking sector of underdeveloped countries. We argue that the banking predominance has not been reflected in an increase in financial inclusion, but has exacerbated social inequalities, reconfiguring what is understood as underdeveloped in the 21st century.

We start with two key concepts: financialization and the *financial complex*. We follow Ugarteche's (2018) interpretation on financialization as the phenomenon in which the capital accumulation base is transferred from the real to the financial sector. This has to do with the tendency to decrease the productive profitability, that is, the capitalists resort to financial operations with the aim of counteracting the fall in the rate of profit. Likewise, Ugarteche (2018) points out the importance of replacing the term financial system with the notion of *financial complex*. The metamorphosis from system to complex occurred after a select group of banks assumed the status of *too big to fail*. This transformation implied that these financial agents became immune to the traditional norms of liberalism. Thus, the emergence of banks too big to fail provoked that the perception of risk, previously fundamental for the calculation of financial gain, was annulled for this select group of agents.

Like the productive structures, the financial complexes are also heterogeneous. This heterogeneity is represented in: a) the coexistence of banks that are *too big to fail* and banks that can fail into the same financial complex, given that the former do not follow the same rules as the latter; and b) gaps in access to financial services. Indeed, the *structural heterogeneity* that was analyzed in terms of productive structures by theoretical traditions such as Latin American Structuralism and Neo-Structuralism reproduces itself in financial complexes through a) the growing banking concentration and the emergence of *too big to fail* banks; and b) the inclusion or exclusion of individuals to the services provided by financial institutions.

This work is divided into five sections. After the introduction, in section two we develop the structural heterogeneity notion. In section three we present an empirical analysis of the banking sector in Argentina and Mexico, beginning with a study of the most general variables of the financial complexes at the aggregate level and, subsequently, presenting a detailed analysis of the five main banks operating in the two countries. In section four we develop an empirical analysis on access to financial services in Argentina and Mexico, identifying the differences and similarities between the level of financial inclusion in the two countries, and the gaps that exist in the way banks provide these services to the population. Finally, in section five we present our conclusions.

METHODOLOGICAL THEORETICAL REFERENCE: THE NATURE OF STRUCTURAL HETEROGENEITY IN UNDERDEVELOPED COUNTRIES

Structural heterogeneity can be defined as a crystallization of social relations, instruments of domination and modes of production that correspond to different stages of development but coexist in a given environment and have relative autonomy in their functioning (Di Filippo & Jadue, 1976). In productive terms, the structural heterogeneity is the result of the asymmetric way in which technical progress was propagated in the peripheral countries. According to Pinto (1970), the picture of structural heterogeneity is transformed as the process of industrialization advances. In contrast to the homogeneity of the developed countries, the productive structure of Latin America is naturally heterogeneous. Thus, Pinto (1970) identified three different strata: a) the primitive, which

is characterized by low levels of productivity and low wages; b) the modern pole, which includes industry, services, and the export sector. This stratum generates a production like that of the central countries; and c) the intermediate pole, which concerns the average productivity of the country.

From this perspective, structural heterogeneity embodies a reproduction of center-periphery relations on the national scale. In other words, while the primitive stratum and the low-income population represent only a tiny part of the structure of the central countries, in the periphery the income is highly concentrated in a small group of individuals and, therefore, the number of people living in poverty is extraordinary.

Structural heterogeneity is shaped by external and internal factors. The first has to do with center-periphery relations, that is, with the way the underdeveloped countries are inserted into the world market of products and international financial markets. Among the external factors are technological dependence, the subordination of monetary policy and external debt. On the other hand, the inmates are determined by the development styles of each nation. Thus, heterogeneity deepens when the benefits of technical progress in the modern pole are not shared with the individuals of the primitive stratum. This situation implies an increasing concentration of income at a social and regional level. In effect, the advance of the modern sector has not spread to the other poles of the economy, on the contrary, rather than a tendency toward homogenization, what really happens and can be expected is a deepening of structural heterogeneity (Pinto, 1970).

The idea that structural heterogeneity can be aggravated over time is based on the persistence of internal colonialism, that is, the exploitation of the primitive stratum by the modern pole. In this context, heterogeneity deepens when exports from the periphery are sold at an overvalued exchange rate, while payments to exports are denominated in undervalued currencies. On the other hand, there is the heterogeneous distribution of public investments in favor of the modern pole. Another important factor to consider is the constant use of resources to finance the consumption of individuals, which limits the possibilities of savings becoming an investment in production (Pinto, 1970).

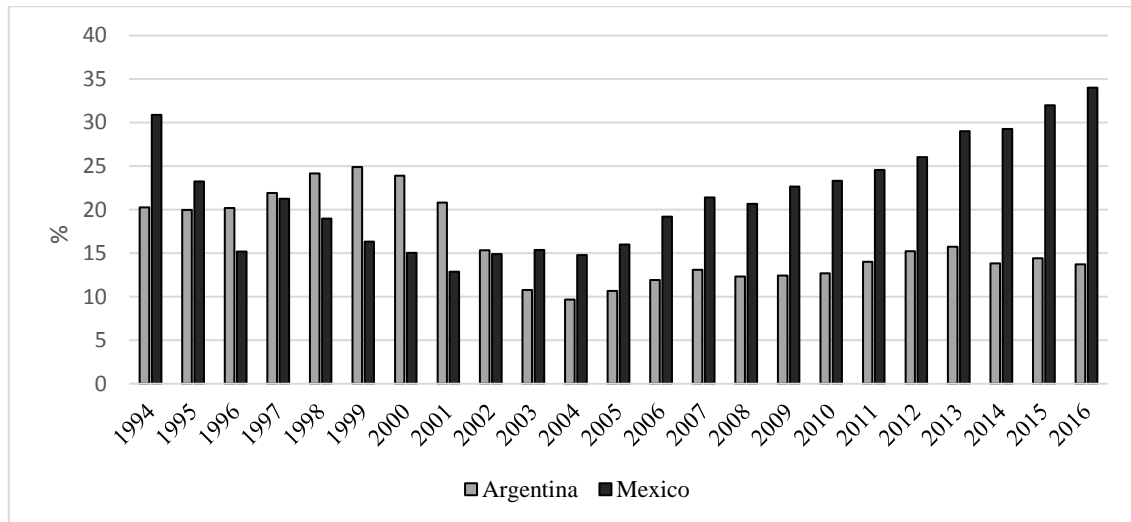
The notion of structural heterogeneity allows us to identify the roots of the unfathomable social inequality of Latin America, given that the productivity gaps show and deepen the gaps of technical progress and access to public goods such as health and working conditions. In addition, heterogeneity occurs both in strata and between agents within the strata themselves (Bielschowsky & Torres, 2018).

RESULTS AND DISCUSSION

Banking concentration and financial reorganization in Argentina and Mexico

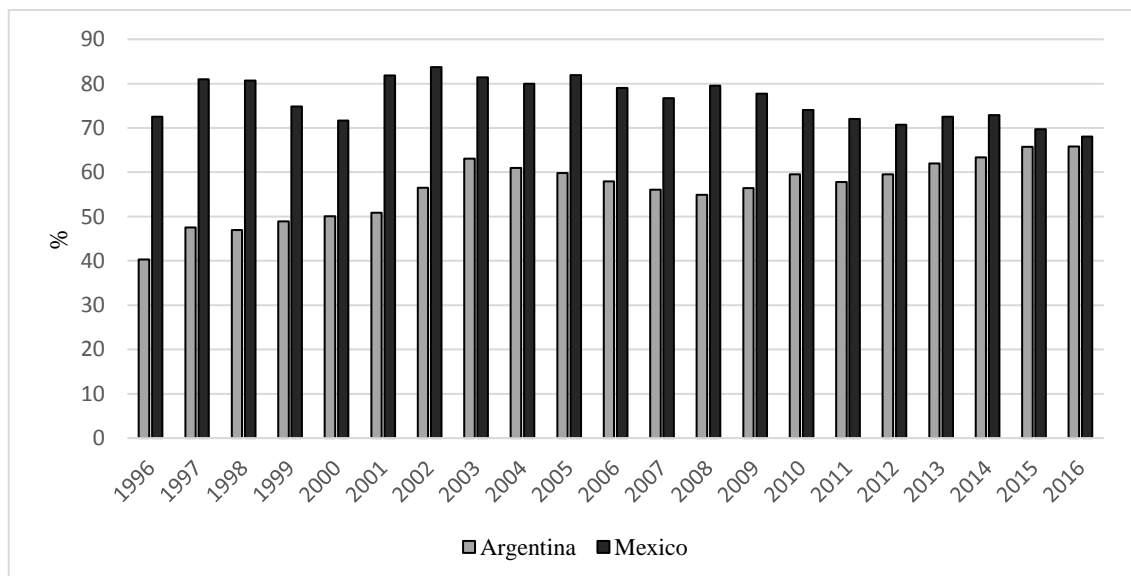
In this section we analyze some general statistics of the financial complex at the aggregate level and, later, we present a more concrete study on the behavior of the banking system in the two countries. Graph 1 shows the domestic credit to the private sector as a percentage of GDP in Argentina and Mexico from 1994 to 2016, a proxy variable for the behavior of the financial complex. In the case of Argentina, credit increased from 1994 to 1999, going from 20% to 24% of GDP. Later, financing to the private sector decreased from 2000 to 2003 with values of 23% and 9% respectively. Subsequently, the credit had sustained growth, except for the year 2008, going from 10% in 2004 to 15% in 2013. Finally, credit has tended to decrease in the last years of the period, reaching 13% in 2016. In the case of Mexico, domestic credit to the private sector had a decreasing trend between 1994 and 2001, going from 30% of GDP to 12%. However, as of 2002, the credit had a sustained increase until the end of the period, going from 14% to 34% in 2016. Thus, we can affirm that the internal credit to the private sector

as a percentage of GDP has followed different trajectories in the two countries during the last years. While in Argentina it has tended to decrease, in Mexico it has increased. It should be noted that we do not have data for 2017 and 2018.



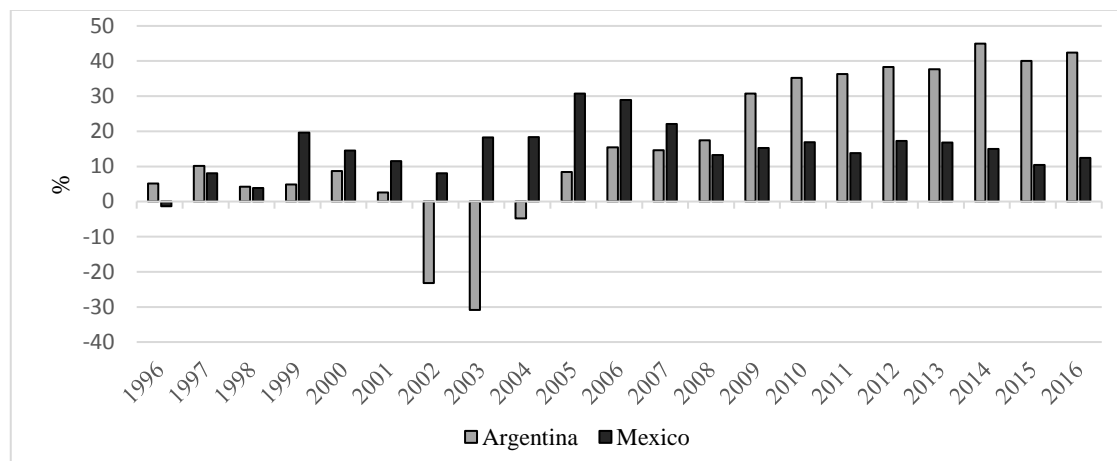
Graph 1. Argentina and Mexico: domestic credit to private sector 1994-2016 (% of GDP)
 Source: author's elaboration with data from World Bank (2019), Global Financial Development.

Graph 2 shows the concentration of assets of the five main banks in Argentina and Mexico, according to their percentage share in the total assets of the banking sector. In the first country, the five largest banks have concentrated 65% of the assets in 2016, in addition, we can identify a growing trend towards concentration since 1996. In Mexico, the concentration of assets has tended to decrease since 2005, reaching 68% in 2016. Despite following opposite trajectories in terms of this variable, bank concentration in Mexico has been higher than in Argentina. However, in 2016 the value of this indicator was very similar in the two countries, so we could expect that in the coming years the concentration of the five main banks in Argentina will exceed that of Mexico since in the first case it has tended to increase and in the second to decrease.



Graph 2. Argentina and Mexico: 5 bank asset concentration 1996-2016
 Source: author's elaboration with data from World Bank (2019), Global Financial Development

Graph 3 shows the trajectory of bank return on capital (ROE) in Argentina and Mexico from 1996 to 2016. In the first case, this indicator collapsed after the 2001 crisis and remained negative until 2004. However, since 2005 the ROE of banks operating in Argentina has tended to increase, going from 8% to 42% in 2016. In the second case, the bank's return on capital collapsed after the 1994 crisis. Between 1996 and 2005, the ROE of banks operating in Mexico was very volatile, reaching a maximum value of 30%. Since 2004, this indicator has tended to decrease, reaching 12% in 2016. Thus, we can identify that the ROE has had a different evolution in each country, while Argentina tends to increase, in Mexico it has decreased. In this sense, the bank return on capital is much higher in the first country.



Graph 3. Argentina and Mexico: ROE before taxes 1996-2016 (percentages)

Source: author's elaboration with data from World Bank (2019), *Global Financial Development*

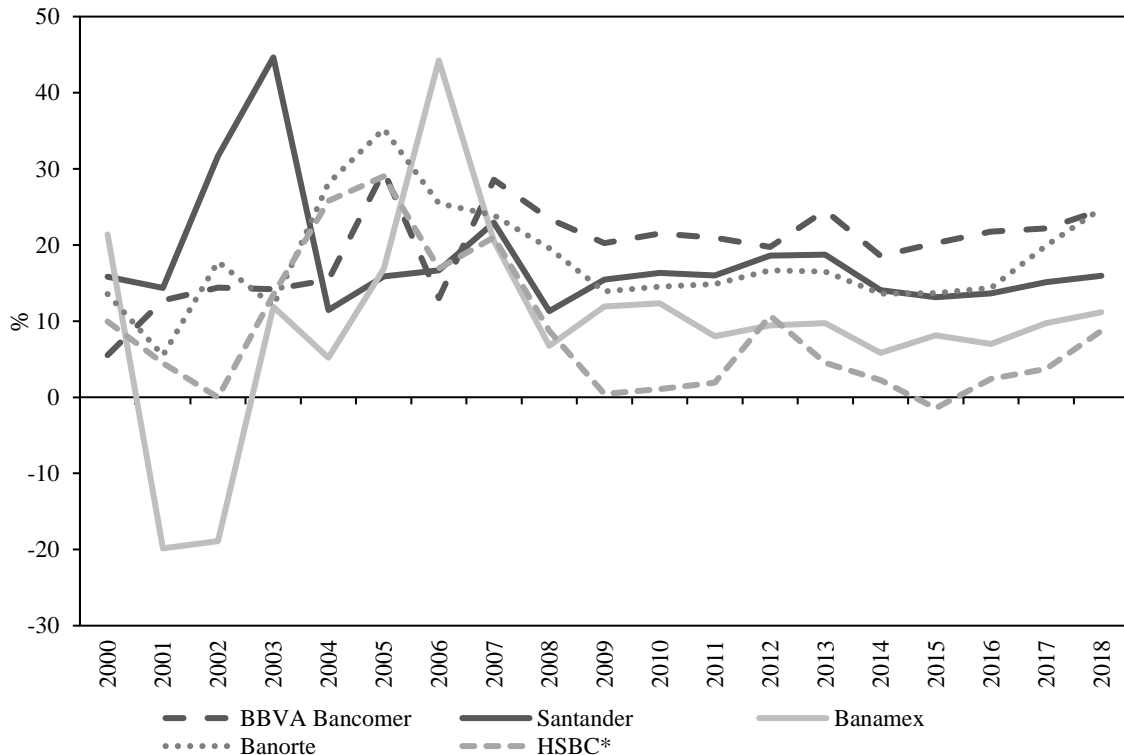
Table 1, which shows the composition of the Argentine banking sector, indicates that its five main banks - Banco de la Nación Argentina, Banco Santander Río, Banco de Galicia and Buenos Aires, Banco de la Provincia de Buenos Aires and BBVA Banco Francés - have together, 2,925,986 million Argentine pesos in assets at the end of 2018, more than four times the Argentine GDP of that year. However, within the same group, there are great disparities. For example, while Banco de la Nación Argentina represented 23.56% of total banking assets, the fifth largest bank, BBVA Francés, represented only 6.47% of total assets. Banco Santander Río is a commercial bank subsidiary of Banco Santander located in Spain and the headquarters of BBVA Francés is the great BBVA. Both institutions, Santander and BBVA are considered Global Systemically Important Financial Banks (FSB, 2018).

Table 1. Argentina: top 5 banks by assets, 2018

No	Bank	Assets (Thousands of Argentine Pesos)	Participation in the banking sector (%)	% of GDP	Origin of capital
1	Banco De La Nacion Argentina	1,216,878,297	23.56	174.92	National
2	Banco Santander Río S.A.	497,755,604	9.64	71.55	Foreign
3	Banco De Galicia Y Buenos Aires S.A.	469,636,156	9.09	67.51	National
4	Banco De La Provincia De Buenos Aire	407,683,242	7.89	58.60	National
5	Bbva Banco Frances S.A.	334,033,040	6.47	48.02	Foreign
Total top 5 banks		2,925,986,339	56.66	420.60	
Total banking sector		5,164,429,262	100.00	742.37	

Source: author's elaboration with data from Banco Central de la República de Argentina (2019) and Instituto Nacional de Estadística y Censos (2019).

In Graph 4 we observe the ROE of the 5 main banks operating in Argentina from 2003 to 2018. We identify that after the 2001 crisis, bank profitability collapsed, given that all banks registered negative returns between 2003 and 2004. In 2005 there was a recovery in profitability, except for Banco Santander Río, which continued to show negative values in its ROE, however, from 2006 until 2012 the bank's return on the capital of this bank was considerably higher than the rest of the group. In general, the ROE of the 5 banks in 2016 was considerably higher than the values presented at the beginning of the period, in addition, despite the differences in the volume of assets, the profitability of the 5 banks has remained at similar levels since 2012 and none has presented negative values since 2006.



Graph 4. Argentina: ROE of top 5 biggest banks, 2000-2018 (percentages)

Source: author's elaboration with data from Banco Central de la República Argentina (2019) and annual reports of every bank

Turning to the case of Mexico, table 2 shows the composition of the Mexican banking sector, where the 5 main banks -BBVA Bancomer, Santander, Banamex, Banorte and HSBC- have altogether 6,834,944 million Mexican pesos at the end of 2018, equivalent to 36.73 % of GDP of that year. However, this does not mean that the Mexican banking system is smaller than the Argentine one, but that Mexico's GDP is considerably higher than that of Argentina. For example, in 2017 Mexico's GDP was 1,150,887 million current dollars, while that of Argentina was 630,430 million current dollars. On the other hand, unlike the Argentine banking system where 3 of the 5 largest banks are from national capital, in Mexico, the banking system is much more foreign. The only national capital bank that appears on the list is Banorte which, in terms of its percentage of participation in the banking sector, 12.41%, is much smaller than the first bank on the list, BBVA Bancomer, which in 2018 represented the 22.05% of total bank assets.

Now, the main shareholder of BBVA Bancomer is BBVA, Santander's parent company is in Spain, Banamex is a subsidiary of Citigroup and HSBC's parent company is in the United Kingdom. The names of these four banks appear in the most recent list of

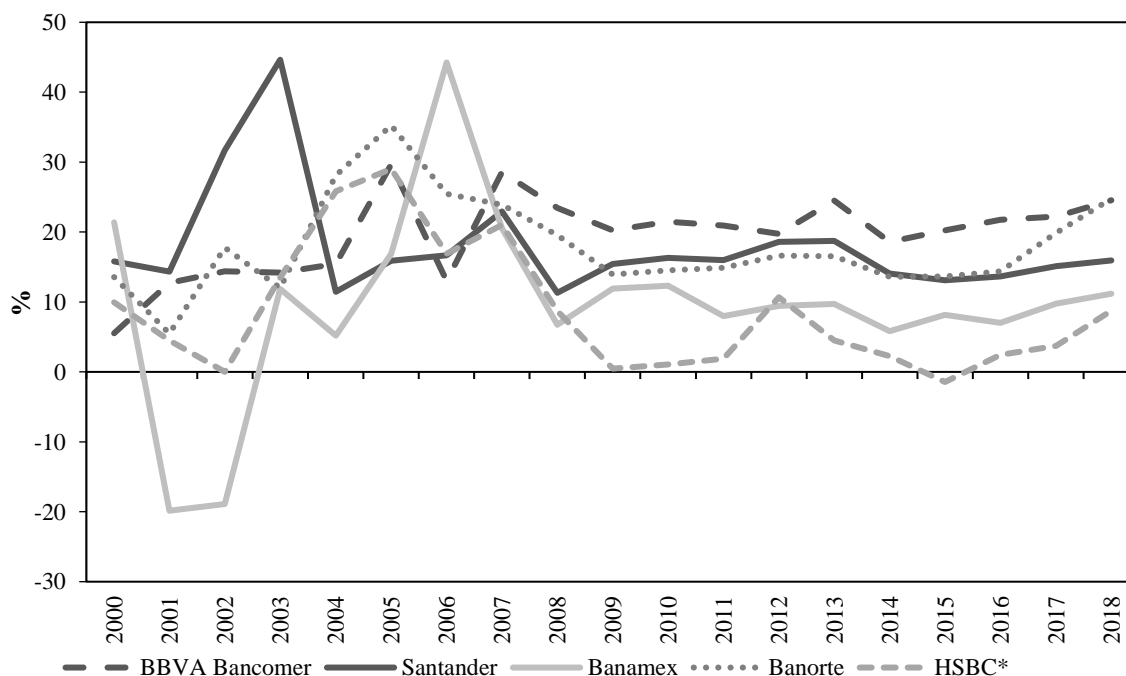
global systemically important banks published by the Financial Stability Board in 2018. Indeed, the four main foreign banks that operate in Mexico form part of the select group of financial institutions *too big to fail*.

Table 2. Mexico: top 5 banks by assets, 2018

No	Bank	Assets (Thousands of Mexican Pesos)	Participation in the banking sector (%)	% of GDP	Origin of capital
1	BBVA Bancomer	2,141,980,349	22.05	11.51	Foreign
2	Santander	1,419,845,733	14.62	7.63	Foreign
3	Banamex	1,258,002,714	12.95	6.76	Foreign
4	Banorte	1,205,797,182	12.41	6.48	National
5	HSBC	809,318,391	8.33	4.35	Foreign
Total top 5 banks		6,834,944,369	70.36	36.73	
Total banking sector		9,714,765,076	100.00	52.20	

Source: author's elaboration with data from Comisión Nacional Bancaria y de Valores (2019) and Instituto Nacional de Estadística y Geografía (2019).

Graph 5 shows the ROE of the 5 largest banks operating in Mexico from 2000 to 2018. Unlike the Argentine case where the group's profitability remains at similar levels, in Mexico, it seems that the higher the number of assets, the higher the ROE, for example, in 2018 BBVA Bancomer was the bank with the highest volume of assets and with the highest ROE. However, Banorte is the exception, given that, although it is the fourth bank in terms of assets, its profitability is very similar to that of BBVA Bancomer. On the other hand, the five banks registered a decrease in their returns after the crisis of 2007-2008, in contrast to the Argentine case where the banks were not affected by the great financial crisis, in addition, the ROE of the banks that operate in Argentina it is greater than that of the Mexican banking system.

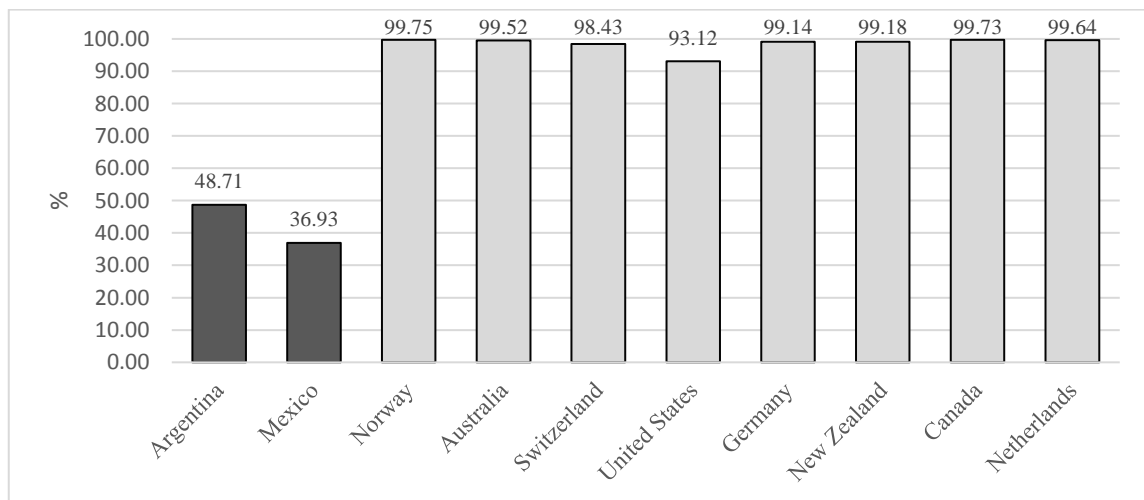


Graph 5. Mexico: ROE of top 5 biggest banks, 2000-2018 (percentages)

Source: author's elaboration with data from Comisión Nacional Bancaria y de Valores (2019), Boletines Estadísticos (HSBC* presented an ROE of -337.81 in 2002. This value appears as 0 in the graph)

The reproduction of structural heterogeneity in access to financial services

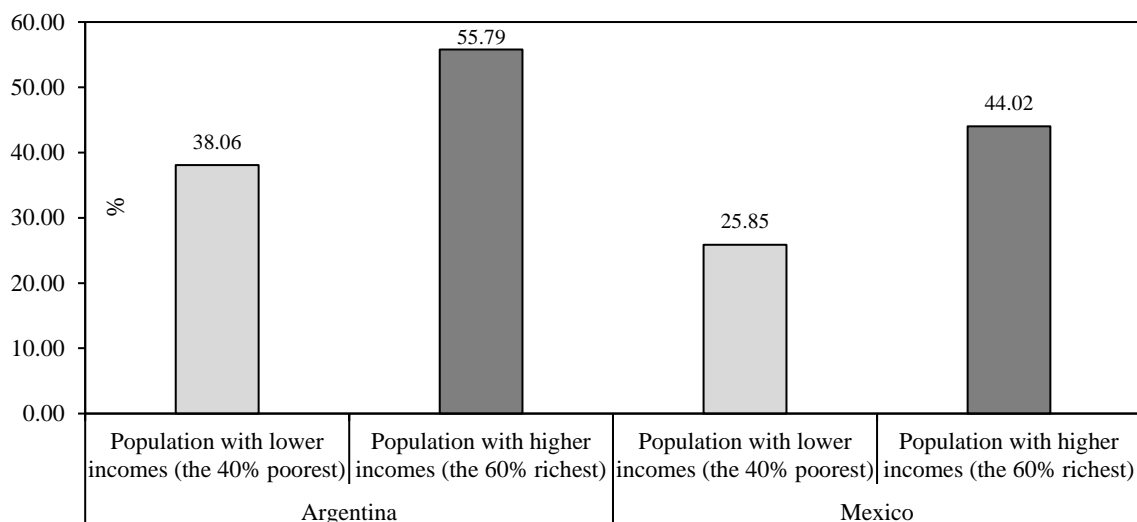
In Graph 6 we can see the percentage of the population that reports having an account in a bank or other financial institution in 2017 for a set of countries that includes our objects of study, Argentina and Mexico, as well as a group of developed countries, among which we can list: Norway, Australia, Switzerland, the United States, Germany, New Zealand, Canada and the Netherlands. According to Graph 6, the level of access to an account in a financial institution is considerably lower in the countries of the periphery than in the rest of the sample. The majority of the countries of the center observed show levels of financial inclusion greater than 98%, with the exception of the United States, which obtained a percentage of 93.12% during this year. In the case of Mexico, the percentage of individuals who reported having an account was 36.93% in 2017, which represents a decrease of 5.64% with respect to the value reached in 2014, which was 39.14%. However, if we compare the percentage obtained in 2017 with the value registered in 2011, 27.42%, we can observe an increase of 34% during this period. In the case of Argentina, the percentage of individuals with access to an account in a bank or a financial institution was 33.13% in 2011, to then increase 51.51%, reaching a value of 50.19% in 2014. However, the percentage of individuals with an account decreased in 2017 to 48.7%, which meant a decrease of 2.9%. Based on these data, we can observe that from 2011 to 2014, Argentina and Mexico had an increase in the population's bancarization. Also, both nations had a decrease in this percentage from 2014 to 2017. On the other hand, the access level of developed countries remained above 87% in the period from 2011 to 2017.



Graph 6. Selected countries: access to an account in any financial institution, 2017
 Source: author's elaboration with data from World Bank (2019), *Global Financial Inclusion*

In Graph 7 we can see the percentage of individuals who report having an account in a bank or other financial institution according to the level of income in Argentina and Mexico. The data are grouped into two groups, the first is the 40% of the population with lower income and the second is the 60% with higher income. Although in the graph we only observe the values obtained in 2017, we again make a comparison with the previous periods, 2011 and 2014. In the case of Argentina, the percentage of low-income individuals with access to an account increased by 126% in 2011 to 2014, this reduced the gap regarding the percentage of higher income individuals. While in 2011, 19% of low-income individuals and 42% of higher income had access to an account, in 2014 the values obtained were 44% and 53% respectively. This sense of equity did not last long, since in 2017 the percentage of low-income individuals with an account decreased 14.7%,

reaching 38%. At the same time, the level of inclusion of people with higher income increased by 3.5%, reaching a value of 55.7%. In the case of Mexico, in 2011 the percentage of the population with lower income who reported having an account was 13.16%, while the proportion of individuals with the highest income was 36.77% during the same year. According to this indicator, both groups had an increase in the level of financial inclusion in 2014. In the case of the first group, the percentage value of low-income individuals increased 119% with respect to the previous year, reaching a total of 29.36%. Although the increase was significant, it was not enough to compensate for the income gap, given that the second group continued to have a much higher percentage, exactly 45.65%. In 2017 there was a decrease in the inclusion of both groups, of 11% in the case of people with lower income and of 3.5% in the case of higher income.

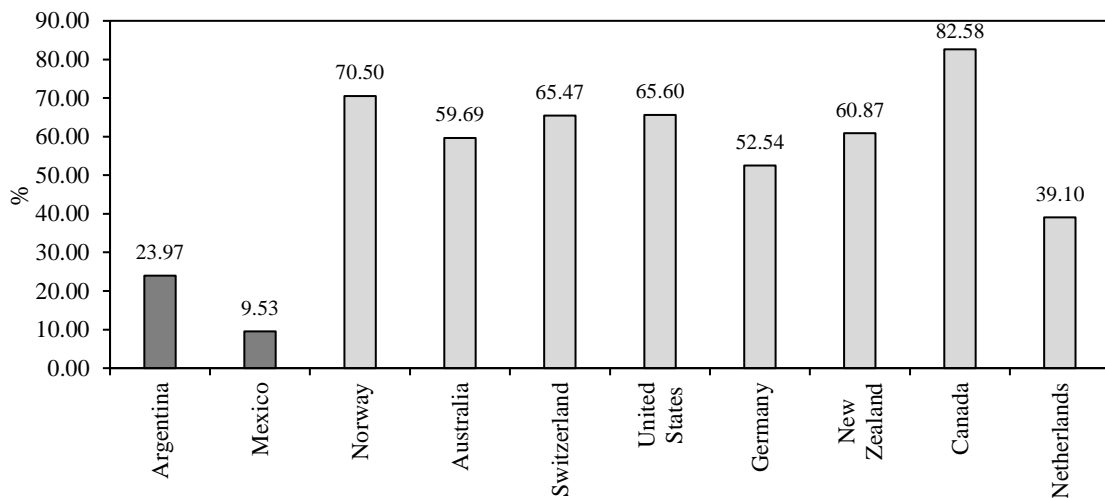


Graph 7. Argentina & México: access to and account in any financial institution by income, 2017
 Source: author's elaboration with data from World Bank (2019), *Global Financial Inclusion*

Thus, from Graph 7 we can argue that, in terms of financial inclusion, Argentina is a more financialized country than Mexico. However, both countries have significant income gaps, while in Mexico the percentage of individuals with higher income who have an account in a bank or a financial institution was 44% in 2017, the proportion of individuals with lower income was only 25.8%. In the case of Argentina, we observed a similar trend, the percentage of the population with the highest income with an account was 55%, while the proportion of people with lower income barely reached 38%.

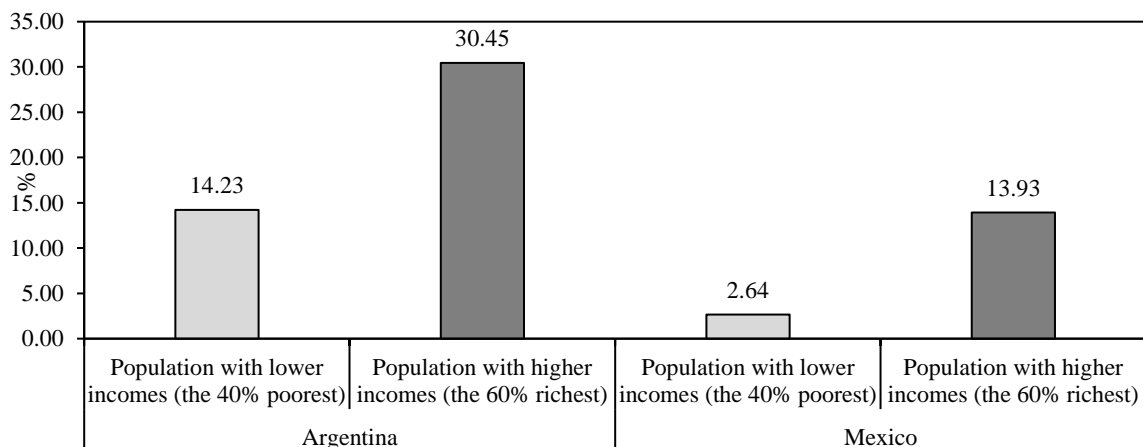
After having studied the percentage of the population with access to an account in a bank or other financial institution, we now present a similar analysis for the index that measures the percentage of people who report having a credit card. In Graph 8 we can see the proportion of individuals with access to a credit card by country in 2017, in the case of Argentina, Mexico and the other eight countries of the center previously analyzed. In this sense, all the developed nations that appear in the graph had a percentage higher than 50%, with the exception of the Netherlands, which had a proportion of 39.10%. Even so, the value obtained by the countries in the periphery was significantly lower than the rest of the sample, Argentina had a percentage of 23.96% and Mexico barely reached 9.52%. If we observe the evolution of the indicator over time, we can see that the underdeveloped countries presented an increase in the inclusion level from 2011 to 2014, of 21.12% in the case of Argentina and of 37.51% in the case of Mexico. Subsequently, from 2014 to 2017 there was a reduction in access to a credit card in both countries, of 9.81% and 46.55% respectively. From these data, we can argue that the asymmetries between the

countries of the center and the countries of the periphery are reproduced in the credit sphere.



Graph 8. Selected countries: credit card ownership (2017)
 Source: author's elaboration with data from World Bank (2019), *Global Financial Inclusion*

On the other hand, in Graph 9 we can see the percentage of the population with a credit card by the level of income in Argentina and Mexico in 2017. At first glance, we can identify that the level of bancarization is considerably higher in Argentina than in Mexico. However, both countries have significant income gaps. In the case of the first country, from 2011 to 2017 there was an increase of 43.29% in the percentage of the population with lower income that has a credit card. At the same time, the proportion of the richest individuals increased by 16.83% from 2011 to 2014 and then fell 12.87% from 2014 to 2017. The reduction of the percentage of the second group did not mean a decrease in the income gap, on the contrary, in 2017, 30.44% of people with higher income reported having at least one credit card, while only 14.22% of the poorest individuals had this financial service. In the case of Mexico, both the poorest and the richest had an increase in the level of financial inclusion from 2011 to 2014, of 31.84% and 38.81% respectively. Then, the percentage of the two groups decreased from 2014 to 2017, 65.52% in the case of people with lower income and 43.37% in the case of those with higher income. Thus, in 2017 the proportion of low-income individuals who reported owning a credit card was only 2.64% while the percentage of people with the highest income was 13.92%.



Graph 9. Argentina and Mexico: credit card ownership by income, 2017
 Source: author's elaboration with data from World Bank (2019), *Global Financial Inclusion*

Based on these data we can see that the differences in the level of financial inclusion are not only visible between countries, but also between the individuals of each nation. One of the key trends that reproduce subordinated financialization is that, unlike developed countries where individuals have compensated for wage stagnation through indebtedness (Stockhammer, 2012), in underdeveloped economies access to credit occurs in a hierarchical way.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

In this paper, we analyzed the banking sector and financial inclusion of Argentina and Mexico in times of financialization. We found that structural heterogeneity reproduces itself in the financial sphere through: a) the coexistence of banks too big to fail and banks that can fail in the same financial complexes; and b) the asymmetries in the level of access to financial services of individuals. We conclude that the operation of large banks in underdeveloped economies hasn't been reflected in increasing credit access. Indeed, we found that high-income individuals have more possibilities of acquiring a loan while low-income individual face higher restrictions when asking for a credit.

Recommendations

During the last thirty years, we have witnessed a transformation in the way banks operate throughout the world, however, this restructuring has been especially strong in Latin America. Unlike Mexico, in Argentina, a large group of state banks resisted the process of financial liberalization and became leaders in the banking system (De Carvalho *et al.*, 2012) However, the presence of foreign banks in domestic markets is a common feature of the two countries in the era of financialization.

In the current context, it is necessary to analyze the differences between developed and underdeveloped countries looking beyond the productive structures. In our attempt to renew the notion of structural heterogeneity it is unavoidable to incorporate into the definition of our theoretical tradition, Latin American Structuralism, the features and trends that shape the financialization of peripheral countries. Thus, unlike the countries of the center that have robust financial complexes and high levels of financial inclusion, in the periphery, most individuals are excluded from financial services and financial complexes are less developed.

The notion of heterogeneity allows us to identify the divergences that exist in the banking sector and in access to financial services. Like the modern pole and the primitive stratum analyzed by Pinto (1970), the reproduction of structural heterogeneity in the financial sphere is based on the disparities between sectors. First, banks too big to fail are immune to risk, which is a crucial element in the calculation of financial gain (Ugarteche, 2018), while banks that do not fit into this group continue under the traditional rules of liberalism. This heterogeneity between agents has shaped the metamorphosis from system to complex. Second, individuals with higher incomes are more likely to obtain a credit or have a bank account, while for individuals with low-income access to these financial services is more restricted.

It is, therefore, necessary to ask ourselves, why the predominance of large banks in the Argentine and Mexican banking systems has not been reflected in increasing access to financial services? One explanation could be that being immune to risk, banks too big to fail are more concerned with participating in complicated financial operations than by increasing their credit portfolio to citizens. Another explanation could be that interest

payments derived from consumer loans are sufficiently profitable that banks do not feel it necessary to encourage the financial inclusion of the rest of the population. Banks impose heavy restrictions when granting a loan in a way that only high-income individuals have access to credit. Given these adversities, we recommend that banks operating in underdeveloped economies be more flexible when granting a loan to increase the financial inclusion of low-income individuals.

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Empirical analysis of macroeconomic factors and Structural Adjustment Program (SAP) on agricultural output

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Abstract

There has been many significant research efforts that have been devoted to understand the effects of macroeconomic factors on the agriculture sector in Nigeria. In addition to the macroeconomic factors, Structural Adjustment Programme (SAP) over the period 1981 to 2017 will be included into the scenario of this study to examine the effects of these factors on agricultural output in Nigeria. This paper employed co-integration analysis and multivariate Granger causality which is carried out using VECM approach to analyse the causal links among all the variables considered for estimation. The findings showed relationship that exists between the agricultural output which is the dependent variable and the independent variables. It also revealed the variations between the dependent and independent variables which are Gross Domestic Product (GDP) growth rate, interest rate, foreign direct investment (FDI), commercial bank loan on agriculture, SAP and inflation rate. In conclusion, commercial loan on agriculture, FDI, interest and inflation rate were macroeconomic variables that contributed to agricultural output in Nigeria within the period examined.

Keywords: *Agriculture output, Macroeconomics factors, Gross Domestic Product, SAP*

JEL Classification: E6, O13, Q18

INTRODUCTION

In economic development theory propounded by Lewis 1954, agriculture was regarded as the basis for industrial growth and development. Agriculture is the engine of growth and development of most nations; often been touted crucial in the economic development as well as one of the major way out from poverty of most third world countries. Recent researches on the causes of development and underdevelopment have identified agricultural transformation as key to economic liberation of worsening countries. In the development and growth arises for most developing nations from the functions of agriculture are basically from its relationships with other sectors of the economy. In this view, it can be presumed that agriculture is the foremost determinants of achieving economic development and whether war against poverty can be won or lost in the long run Eyo (2008); Omotor, Orubu & Inoni (2009).

In Nigeria, the development of agriculture has been slow in spite of various agricultural policies. In fact, various programmes are being introduced and implemented by the government to improve the situation ever since 1970s. These programmes involved encouraging of mechanized large scale farming by the federal and state government. River Basin Development Authority (RBDA), Operation Feed the Nation (OFN), National Acceleration of Food Production (NAFP), Structural Adjustment Programme (SAP) and so on are part of the programmes introduced. However, SAP was being implemented to serve as an economic liberalization for the country. Likewise the government established the Agricultural Credit Scheme (ACS) to cater for the financial aspect Omotor, Orubu & Inoni (2009). Despite agricultural sector's efforts with characteristics of limited areas used for cultivation, low yields and level of inputs as a result of government dependence on mono-sector economy that is oil, the sector can still be seen as an engine that contributes to the growth of the overall economy of Nigeria.

The nation faced several economic crisis which can be characterized with mass unemployment, rising rates of inflation, huge public debt, disequilibrium in the balance of payments and a severe shortage of essential raw materials; before the economy deregulation by the introduction of SAP in July 1986. Likewise declined in the country's major foreign earner that is oil can also be a factor responsible for the crisis. Recently, the agricultural sector in developing countries have recorded profane declines in terms of its contribution to export earnings and domestic consumption. This observation can be associated with policy indolence among other factors. The SAP adopted in Nigeria in the 1980s, is one policy shift aimed at boosting agricultural production. The introduction of SAP was to remedy the situation by restructuring and diversifying the prolific base of the economy as the major aim. Furthermore, establishing of a realistic and sustainable exchange rate for the naira was part of the objectives to be achieved through the key instruments of SAP which include trade liberalization and tariff reforms Gbosi (1996).

In spite of all these measures, the slow growth of agricultural sector could have created issues like insufficient food for the populace, inadequate raw materials for the industrial sector and decrease in its foreign exchange earnings. However, the growth rate of agricultural output over the years as either be stagnated and failed to keep pace with the countries rapid population growth. This resulted into shortage of food, continuous souring food prices, and mass food importation by the government. Based on this, it is obvious that the Nigerian economy can't achieve desired sustainable growth rate in the low and absence of agricultural output of the country. More so since the serious declined of agricultural output over the past three decades could have been constituting into the high incidence of rural poverty. Therefore necessitate for enhancing of agricultural productivity in developing countries like Nigeria where industrial production is at minimal level.

In the light of these mentioned facts, resulted to the question on what are the macroeconomic factors that affects agricultural output in Nigeria? Since the economic and physical welfare of the country can depend on increasing and stabilizing of agricultural output through more effective policies, technologies, programmes and practices. Likewise, agriculture roles can't be overstressed in transforming the economic framework of any country given that it serves as source of food for animal and man, provision of raw materials and help in the poverty reduction of most countries. Also, it serves as the key sector that provides employment to huge segments of the population and vital to sustained economic growth of most developing countries. More so going about for improvement in a country's economic development and how the country tends to achieve the aim, using agriculture as tool indeed remains an arguable topic Anthony (2010).

The paper aims to empirically investigate the impact of macroeconomic policies on agricultural output in relation to its role as source of food and foreign exchange earnings

to the nation. Therefore, the main focus of the paper is to further evaluate empirically the presence and way of Granger causality between agricultural output and food import value to help the policy makers for having a better insight into economic growth and to formulate effective economic policies.

LITERATURE REVIEW

The achievement of sustainable and inclusive growth has been the main aim of most nations of the world, which has created lot of consideration among the various schools of economic thought extending from the classical to the neo-classical views. In the discussion of growth theory decades, the neo-classical exogenous growth theory has been the dominant school of thought. The Solow-Swan growth model explained that output growth rate is based on two exogenous factors in the long run which are technical progress and growth in labour and capital contributions. This model provided the few links of macroeconomic factors influence on output growth. As a result of this model deficiencies, led to the development of other growth theories such as Feder, Ram and Grossman and Mankiw, Romer and Weil models that encompasses other exogenous variables. According to the Feder's model, there is the inclusion of export as part of the two basic variables (capital and labour) in the general production framework which is the supply side.

However, for examining of the relationship between macroeconomic variables and output, this paper will present models based on the existing literatures where a production function framework in which capital, labour, exports, terms of trade and other factors are used as possible explanatory inputs.

Several studies have been directed to observe the influences of macroeconomic variables on agriculture because of the essentiality of this issue in the growth of nations. In various nations, significant research efforts such as Schuh, 1974; Tweeten, 1980; Gardner, 1981; Chambers & Just, 1982; Orden & Fisher, 1991; Kargbo, 2000; 2007 and so on have been devoted to understanding of macroeconomic variables linkages to agriculture. Schuh (1974) introduced the significance of the effects of macroeconomic policy for agriculture, whereas exchange rates was considered to be as a channel of macroeconomic policy transmission to agricultural sector. Nevertheless, it was argued that the overvaluation of the dollar and policy approaches to battle with the worse adjustment problems of agriculture in U.S in 1950s resulted in fluctuating of a vital share of the technical change's benefits to the consumer. In addition it was discovered that the devaluation of the dollar recently constitutes a key structural change for U. S. agriculture. Similarly, Baek & Koo (2007) investigated on the effects of the exchange rate, income and money supply of the United States and its major trading partners on agricultural trade balance using an autoregressive distributed lag (ARDL) model. It was found that the exchange rate is a crucial determinant of the short and long-run trade balance's manners. The income and money supply in both the United States and the trading partners was found to have significant impacts on U.S. agricultural trade in both the short and long run. In the same manner, Baek & Koo (2009) also examined short and long run effects of exchange rate fluctuations on bilateral trade of agricultural products between the United States and its 10 major trading partners using an ARDL approach to cointegration. In the long run, results revealed that while U.S. agricultural exports are extremely responsive to bilateral exchange rates and foreign income, the country's agricultural imports are generally sensitive to the U.S. domestic income. On the other hand, both the bilateral exchange rates and income in U.S and its trading partners are found to have significant impacts on U.S. agricultural exports and imports in the short run.

Gil, BenKaabia & Chebbi (2009) analysed the impact of alterations in the monetary policy and the exchange rate on agricultural supply, prices and exports using the multivariate cointegration approach covering annual data from 1967 to 2002. Variables

such as interest rate, exchange rates, money supply, inflation, agricultural output and input prices, agricultural supply and exports, income and the rate of commercial openness are considered in the study. The results of the study indicated that changes in the chosen macroeconomic factors have an influence on the agricultural sector, while the reverse effect does not hold. Likewise, Alagh (2011) examined the macroeconomic factors linkage with agriculture in India. From the extensive review of the past works the question “is there a structural constraint in agriculture or does agriculture work in a system in which as demand rises and prices rise, supply responds in the country?” emerged. This question led the study to the analysis of macroeconomic policy variables particularly government expenditure and money supply on agricultural prices and interest rates for agriculture. A partial economy framework using lags to help the specifications of model was used, while a Causal Chain model exhibited the econometrically macro policies impact on agriculture in an important way.

Kargbo (2000) examined impacts of monetary and macroeconomic factors on real food prices in eastern and southern Africa during 1980 to 1996 era. The study used cointegration technique and error correction modelling to test the long-run relationship between real food prices and the selected factors that influence some African countries’ behavior. It was found that fluctuations in domestic food production, fused with income, trade, exchange rate and monetary policies have significant impacts on real food prices. Similarly, Colman & Okorie (1998) examined the effects of the trade and foreign exchange management policies of SAP on agricultural export in Nigeria. Protection rates and incidence parameter are used to assess the policy results over the period (1970 – 1992). The findings indicated that the protection of import-competing sectors has not been eradicated and has resulted into the taxation of all export goods, with major proportion of such taxes borne by agricultural exports. The failure to maintain steady policies and slightly weak approach to implementation of some policies, led to the inability of the SAP policy instruments to achieve its aims. Omotor, Orubu & Inoni (2009) examined the effects of policy reform on Nigeria’s agricultural exports. The result indicated that agricultural export is significantly influenced by domestic consumption and economic liberalization. Thus, suggested that policy reforms on agricultural productivity should go beyond liberalization of the economy.

In the same manner, Iganiga & Unemhilin (2011) examined the effect of Federal government agricultural expenditure on agricultural output coupled with other variables like aggregate commercial credits to agriculture, consumer price index, annual average rainfall, population growth rate, food importation and GDP growth rate. Co-integration and Error Correction methodology were employed for analysing long and short run impacts of the variables on the agricultural output. It was concluded that investment in the agricultural sector is vital and should be accompanied with supervised credit facilities. In addition, food importation should be ban in order to encourage local producer. Similarly, Lawal (2011) studied on the level of government spending on the agricultural sector and GDP by a simple linear regression. It was found that government spending follow an irregular pattern and that the influence of the agricultural sector to GDP has a direct relationship with government finance to the sector. The study therefore recommended that government should increase her financial plan allocation on agricultural sector because of the sector’s main role to economic growth and development of nations. Eyo (2008) examined the effect of macroeconomic policies adopted on agricultural output growth in Nigeria. It was found that exchange rate system lately did not stimulate agricultural export. In all, recommendation on macroeconomic policies that will reduce inflation, increase foreign private investment in agriculture, present encouraging exchange rates, make agricultural credit to have significant effect on agricultural output growth would be helpful in revitalizing government expenditure in the sector and ensure agricultural output growth in country.

Linkages has been established between nation’s growth and agriculture, since the agricultural sector’s performance is being seen as the prospects of non-oil sector and the economy overall. Likewise several macroeconomic variables and policies has be linked to sectors output growth particularly on agriculture based on this study reviewed, thus necessitate investigating of macroeconomic factors influencing agricultural output in Nigeria.

METHODOLOGY

The study was conducted in Nigeria; one of the sub-Sahara Africa countries situated on the Gulf of Guinea in the western Africa’s part. This study utilized secondary data regarding the selected macroeconomic variables and Nigeria’s agricultural output. Annual data covering 1981 - 2017 are analysed through the unit root test, Granger causality test and regression analysis. The data were sourced the World Bank Database, Central Bank of Nigeria Statistical Bulletin and Annual financial reports of Statistics of various issues.

Estimation procedure and technique

Augmented Dickey Fuller (ADF) and Philips-Perron (PP) test are employed for conducting of the unit root test; for determining the order of integration.

Model specification

$$Y_t = C_0 + C_1Col_t + C_2Fdi_t + C_3GDPgr_t + C_4SAP_t + C_5Inf_t + C_6Int_t + U_t$$

Where: Y_t = Agricultural output; Col_t = Commercial loan on agriculture; Fdi_t = Foreign direct investment; $GDPgr_t$ = gross domestic product growth rate; SAP_t = Structural adjustment programme (dummy); Inf_t = Inflation rate; Int_t = Interest rate; $C_0, C_1, C_2, C_3, C_4, C_5$ and C_6 = constants; U_i = error term

Table 1 shows VAR lag order selection criteria for the variables (Agriculture comm_loan_on_agric, FDI, GDP_growth_rate, Inflation_rate, Interest_rate, SAP). The lag order selection criteria table is the computation of various criteria such as Akaike information criterion (AIC), Schwartcz information criterion (SIC) and Hannan-Quinn (HQ), to aid in the selection of the lag order of a regression model. The table exhibits various information criteria for all lags to the maximum specified. Hence, the selected lag from the columns’ criteria are portrayed by as asterisk.

Table 1. Lag order selection criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
1	-893.7603	NA	4.36e+19*	65.01795	67.32821*	65.74149
2	-863.3145	31.49561	2.70e+20	66.29755	70.91807	67.74464
3	-764.4843	54.52700	6.94e+19	62.86099*	69.79176	65.03162*

* indicates lag order selected by the criterion

Table 1 indicates the selected lag for each column criterion with the asterisk (*). The selected lag that was revealed by the criteria - AIC and HQ is lag 3, while lag 1 was chosen by the SC.

EMPIRICAL RESULTS AND DISCUSSION

Unit root test

This test is to observe the stationarity and non-stationarity of the specific data (time series data) to be use. The test is to identify how shocks can be temporary and eliminated overtime towards the actualization of the long run mean values. The test also is to reveal the theoretical correlogram of a stationary and non-stationary series as there is an increase in lag length.

Table 2. ADF and PP unit root test

Variable	ADF		PP		Result
	Constant	Trend and constant	Constant	Trend and constant	
Agriculture	5.99932***	6.15551***	7.67625***	9.62648***	I (1)
Comm. Loans	2.44387***	7.10493***	6.30116***	7.06766***	I (1)
FDI	7.74431***	7.73606***	12.7134***	16.9474***	I (1)
GDP growth	8.42801***	8.29934***	22.2864***	25.1127***	I (1)
Interest rate	6.90695***	6.79369***	29.5365***	31.3619***	I (1)
Inflation rate	6.76622***	6.70065***	24.5455***	30.2939***	I (1)

Notes: *** denotes rejection of the null hypothesis of a unit root at the 1% significance level.

According to Table 2, the unit root test result using ADF and PP including lag length selected by Schwarz Criterion (SC) are both at level and first differences of all variables. All variables remain stationary at first difference according to ADF and PP unit root test. In summary, according to the two methods of unit root tests, we can conclude using ADF and PP that all variables (FDI, Commercial bank loan on agriculture, interest rate, agricultural output, inflation rate, GDP growth rate) are stationary at I (1).

Co-integration test

Co-integration test can be conducted once the variables of the regression analysis has successively been stationary at first differences I (1). This test is provides an evidence of long run relationship between the independent and dependent variables.

Table 3. Co-integrating test results

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.974305	279.1775	125.6154	0.0000
At most 1 *	0.960616	172.9955	95.75366	0.0000
At most 2 *	0.691215	79.19794	69.81889	0.0074
At most 3	0.461594	45.11976	47.85613	0.0884
At most 4	0.381468	27.16464	29.79707	0.0977
At most 5	0.313300	13.23287	15.49471	0.1065
At most 6	0.077298	2.333007	3.841466	0.1267

Trace test indicates 3 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted cointegration rank test (maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.974305	106.1820	46.23142	0.0000
At most 1 *	0.960616	93.79755	40.07757	0.0000
At most 2 *	0.691215	34.07818	33.87687	0.0473
At most 3	0.461594	17.95513	27.58434	0.4989
At most 4	0.381468	13.93177	21.13162	0.3706
At most 5	0.313300	10.89987	14.26460	0.1593
At most 6	0.077298	2.333007	3.841466	0.1267

Max-eigenvalue test indicates 3 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level,

**MacKinnon-Haug-Michelis (1999) p-values

Notes:

- (a) *r* represents the numeral of cointegrating vectors at level of 5%
- (b) Trace test symbolizes the inclusion of 3 cointegrating equation at the level of 5%
- (c) Max-Eigen value shows that 3 cointegrating equation at 5% significance level
- (d) refer to the rejection of the null hypothesis at level of 5%
- (e) Critical value are derived from Mackinnon-Haug -Michelis (1999)

Table 3 represents the co-integration rank r test result, which is in line with ADF and PP unit root test of stationary levels, showing that all the variables are integrated at first difference that is I(1). The Trace and Max-Eigenvalue test results indicated that there are three (3) co-integrating equations, which implies the existing of long run relationship between the variables examined. This existence thereby pave way for the use of vector error correction model (VECM) analysis.

VECM analysis

VECM is the important and popular means to measure the correction from disequilibrium of the co-integration test for making of good economic implication. The test assists in eliminating trends from the variables used in the analysis of the previous test to solve the problem of spurious regression.

Table 4. Vector error correction model results

Standard errors in () & t-statistics in []							
Cointegrating Eq:		CointEq1					
Agriculture(-1)		1.000000					
Comm_loan_on_agric(-1)		-75118.51	(4663.87)	[-16.1065]			
FDI(-1)		24920.33	(73292.8)	[0.34001]			
GDP_growth_rate(-1)		-115484.7	(22834.4)	[-5.05748]			
Inflation_rate(-1)		126023.6	(24275.0)	[5.19150]			
Interest_rate(-1)		245341.8	(38862.3)	[6.31311]			
SAP(-1)		-569812.8	(487716.)	[-1.16833]			
C		-997342.1					
Error Correction:	D(Agriculture)	D(Comm_loan_on_agric)	D(FDI)	D(GDP_growth_rate)	D(Inflation_rate)	D(Interest_rate)	D(SAP)
CointEq1	-0.139791 (0.07797) [-1.79292]	6.39E-06 (5.9E-06) [1.07657]	-1.19E-07 (5.4E-07) [-0.22148]	-1.19E-07 (2.0E-06) [-0.06001]	1.69E-05 (7.3E-06) [2.31138]	-1.20E-05 (4.4E-06) [-2.76177]	-1.20E-08 (4.2E-08) [-0.28340]
D(Agriculture(-1))	0.769490 (0.15506) [4.96263]	2.44E-05 (1.2E-05) [2.06702]	-3.52E-08 (1.1E-06) [-0.03285]	-9.74E-07 (3.9E-06) [-0.24749]	-2.42E-06 (1.5E-05) [-0.16623]	1.53E-06 (8.7E-06) [0.17646]	-3.18E-08 (8.4E-08) [-0.37932]
D(Comm_loan_on_agric(-1))	-2577.620 (4530.82) [-0.56891]	0.120091 (0.34466) [0.34843]	-0.013408 (0.03128) [-0.42866]	0.007211 (0.11506) [0.06268]	0.710559 (0.42453) [1.67377]	-0.547447 (0.25331) [-2.16119]	-0.000622 (0.00245) [-0.25339]
D(FDI(-1))	1598.987 (31665.5) [0.05050]	-2.351541 (2.40883) [-0.97622]	-0.311242 (0.21861) [-1.42371]	0.509259 (0.80411) [0.63332]	3.083160 (2.96696) [1.03916]	-1.026600 (1.77034) [-0.57989]	0.008767 (0.01714) [0.51141]
D(GDP_growth_rate(-1))	-19666.63 (10357.8) [-1.89872]	0.860856 (0.78793) [1.09255]	0.058868 (0.07151) [0.82323]	-0.411314 (0.26303) [-1.56378]	0.635114 (0.97050) [0.65442]	-0.433711 (0.57908) [-0.74896]	0.003411 (0.00561) [0.60834]
D(Inflation_rate(-1))	20638.88 (9193.64) [2.24491]	-0.770354 (0.69937) [-1.10150]	0.002782 (0.06347) [0.04383]	0.055477 (0.23346) [0.23763]	-1.249230 (0.86142) [-1.45020]	0.593322 (0.51400) [1.15433]	0.000992 (0.00498) [0.19924]
D(Interest_rate(-1))	38295.28 (15541.4) [2.46408]	-1.590450 (1.18225) [-1.34527]	0.013489 (0.10730) [0.12571]	0.027540 (0.39466) [0.06978]	-1.351108 (1.45619) [-0.92784]	0.570266 (0.86889) [0.65632]	0.001357 (0.00841) [0.16124]
D(SAP(-1))	-369380.4 (436520.) [-0.84619]	7.861688 (33.2066) [0.23675]	2.446767 (3.01366) [0.81189]	-9.832261 (11.0850) [-0.88699]	68.92877 (40.9007) [1.68527]	-39.09758 (24.4048) [-1.60204]	0.024332 (0.23633) [0.10296]
C	183794.8 (98576.7) [1.86449]	-0.914759 (7.49884) [-0.12199]	0.041482 (0.68056) [0.06095]	1.049758 (2.50325) [0.41936]	-7.500583 (9.23635) [-0.81207]	5.653206 (5.51119) [1.02577]	0.047334 (0.05337) [0.88692]
R-squared	0.678097	0.371282	0.211175	0.233936	0.478647	0.503851	0.065778
Adj. R-squared	0.555467	0.131771	-0.089329	-0.057898	0.280036	0.314842	-0.290116
Sum sq. resids	3.08E+12	17829.11	146.8486	1986.787	27048.46	9630.140	0.903081
S.E. equation	383032.2	29.13770	2.644389	9.726711	35.88902	21.41444	0.207374
F-statistic	5.529631	1.550166	0.702735	0.801605	2.409977	2.665748	0.184825
Log likelihood	-422.8943	-138.3790	-66.39123	-105.4643	-144.6310	-129.1400	9.978950
Akaike AIC	28.79295	9.825268	5.026082	7.630954	10.24206	9.209333	-0.065263
Schwarz SC	29.21331	10.24563	5.446441	8.051313	10.66242	9.629692	0.355096
Mean dependent	446597.9	9.683333	0.023423	0.177749	0.148064	0.080000	0.033333
S.D. dependent	574491.3	31.27073	2.533644	9.456796	42.29668	25.87088	0.182574
Determinant resid covariance (dof adj.)			2.59E+19				
Determinant resid covariance			2.14E+18				
Log likelihood			-931.0663				
Akaike information criterion			66.73775				
Schwarz criterion			70.00721				

Table 4 presents the result of VECM, which is subject to change in agriculture (1st column), commercial loan on agriculture (2nd), FDI (3rd), GDP growth rate (4th), inflation rate (5th), interest rate (6th) and SAP (7th). The coefficient of error correction term consists of information as to whether past affect the present values of variables under the study. Meaning any significant coefficient denotes that past equilibrium error influences the outcome of the present.

VECM test using causality

VEC granger causality test on stationary variables is show the ability of one variable to predict or cause the other variables in the model. This test therefore indicates how the variables in the specified model affect each other with distributed lags.

Table 5. VEC Granger causality/block exogeneity Wald tests

Excluded	Chi-sq	Df	Prob.
Dependent variable: D(Agriculture)			
D(Comm_loan_on_agric)	0.323656	1	0.5694
D(FDI)	0.002550	1	0.9597
D(GDP_growth_rate)	3.605153	1	0.0576
D(Inflation_rate)	5.039608	1	0.0248
D(Interest_rate)	6.071666	1	0.0137
D(SAP)	0.716044	1	0.3974
All	9.578659	6	0.1436
Dependent variable: D(Comm_loan_on_agric)			
D(Agriculture)	4.272588	1	0.0387
D(FDI)	0.953002	1	0.3290
D(GDP_growth_rate)	1.193672	1	0.2746
D(Inflation_rate)	1.213292	1	0.2707
D(Interest_rate)	1.809746	1	0.1785
D(SAP)	0.056051	1	0.8128
All	11.56216	6	0.0725
Dependent variable: D(FDI)			
D(Agriculture)	0.001079	1	0.9738
D(Comm_loan_on_agric)	0.183749	1	0.6682
D(GDP_growth_rate)	0.677707	1	0.4104
D(Inflation_rate)	0.001921	1	0.9650
D(Interest_rate)	0.015804	1	0.9000
D(SAP)	0.659170	1	0.4169
All	2.337241	6	0.8862
Dependent variable: D(GDP_growth_rate)			
D(Agriculture)	0.061252	1	0.8045
D(Comm_loan_on_agric)	0.003928	1	0.9500
D(FDI)	0.401093	1	0.5265
D(Inflation_rate)	0.056466	1	0.8122
D(Interest_rate)	0.004869	1	0.9444
D(SAP)	0.786751	1	0.3751
All	1.912426	6	0.9276
Dependent variable: D(Inflation_rate)			
D(Agriculture)	0.027633	1	0.8680
D(Comm_loan_on_agric)	2.801517	1	0.0942
D(FDI)	1.079861	1	0.2987
D(GDP_growth_rate)	0.428267	1	0.5128
D(Interest_rate)	0.860885	1	0.3535
D(SAP)	2.840146	1	0.0919
All	6.599436	6	0.3595
Dependent variable: D(Interest_rate)			
D(Agriculture)	0.031138	1	0.8599
D(Comm_loan_on_agric)	4.670759	1	0.0307
D(FDI)	0.336270	1	0.5620
D(GDP_growth_rate)	0.560946	1	0.4539
D(Inflation_rate)	1.332487	1	0.2484
D(SAP)	2.566547	1	0.1091
All	7.669848	6	0.2633
Dependent variable: D(SAP)			
D(Agriculture)	0.143881	1	0.7045
D(Comm_loan_on_agric)	0.064208	1	0.8000
D(FDI)	0.261536	1	0.6091
D(GDP_growth_rate)	0.370084	1	0.5430
D(Inflation_rate)	0.039695	1	0.8421
D(Interest_rate)	0.025998	1	0.8719
All	1.422120	6	0.9645

Table 5 shows the causation test analysis by using VECM and revealed that there is existence of long run relationship between agriculture and inflation rate, GDP growth rate and interest rate. Also, there is presence of one way causality between commercial loan on agriculture and agriculture. Similarly interest rate has presence of one way causality to commercial loan on agriculture.

Thus in the short and long run, interest rate, foreign direct investment and inflation rate positively influenced the agricultural output which is consistent with the studies of Karbgo (2007), Baek & Koo (2009) and Gil, BenKaabia, & Chebbi (2009). The commercial loans on agriculture oil price has negative sign in determining the performance of agricultural output. The SAP policy included in the model reveals a negative effect on the agricultural output, which follows the findings of Colman & Okorie (1998) and Omotor, Orubu & Inoni (2009). The previous year derivation from long run equilibrium is corrected at an adjustment speed of 13.9 percent. In addition, the granger causality test shows that interest and inflation rate granger causal agricultural output while SAP does not. Also there was indication of commercial loans on agriculture does granger causal agricultural output, likewise interest rate does granger causal commercial loans on agriculture.

CONCLUSION AND RECOMMENDATIONS

Conclusion

The study has been able to establish a long run relationship between the agricultural output and the explanatory variable (FDI, Commercial bank loan on agriculture, interest rate, SAP, inflation rate, GDP growth rate). The study concluded that FDI, Commercial bank loan on agriculture, interest rate, SAP, inflation rate, GDP growth rate are significant variables that affect agricultural output in Nigeria whereas SAP is insignificant. Thus, the insignificant of this variable implies that most policies coming into play in the country's economic needed to be critically examined and well-structured before implemented. Also this study implies that more funds through different means (government and private sectors) can be tailor to boost the agricultural output.

Recommendations

The study hereby recommended that adequate financing of agriculture will improve the sector, likewise government should restructure and make new policy that will encourage farmers to produce more than the present situation.

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Determinant of micro, small and medium enterprises on carrying out a credit loan in Jambi Province

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Abstract

This study aims to analyze the determinant of micro, small and medium enterprises (MSMEs) on carrying out a credit loan. Primary data has been used in the analysis. The population in this study were all MSMEs in Jambi Province. Samples were taken by purposive random sampling. Total sample are 276 consisting of 163 MSMEs actors who took credit and 113 MSMEs actors who did not take credits. To analyze the factors that influence the taking of credits, a binary logit model is used. The dependent variable is the taking of credits, while the independent variables are household characteristics and individual characteristics of MSMEs actors. The results showed that the factors significantly affected the MSMEs on taking credit were the side job variables, working hours, working partners, gender, education, long established business, household expenses and account ownership.

Keywords: *MSMEs, credit, household characteristics, binary logit*

JEL classification: G21, M21

INTRODUCTION

Micro, small and medium enterprises (MSMEs) have an important role for development in Indonesia, this can be seen from the large number of business units in all economic sectors reaching 59,304,787 units in 2013, and their large contribution to employment and income opportunities, especially in rural areas and for low-income families. One common feature inherent in MSMEs in Indonesia is that capital is still weak. In weak economic circles there are usually problems that are lack of capital, that so often experience obstacles and difficulties in developing their business. Capital is a very important factor in supporting the production and performance of MSMEs itself, especially on micro-entrepreneurs and traders economically weak groups (small businesses) (Tambunan, 2012)

The results of the Bank Indonesia Survey, Year 2010, show that the number of MSMEs that access formal capital is still low. One indicator can be seen from the number of MSMEs credit accounts in banks which are the main formal sources of financing as many as 9,078,322 accounts in 2012. This figure is only 16% of the total MSMEs of 56,534,590 business units. The proportion of MSMEs loans in total bank credit in the same year was only 19.9%.

The total allocation of bank credit for MSMEs and non-MSMEs loans in Indonesia can be seen from the total bank loans channeled. MSMEs loans are relatively smaller compared to non-MSMEs loans. In 2013 it amounted to Rp.640,034.50 billion, despite an increase in the number of loans disbursed from the previous year, but in

percentage terms the allocation of MSMEs loans fell to 20%. (Bank Indonesia, 2014). On the other hand the number of MSMEs business units and the number of workers continues to increase.

The development of MSMEs loans in Jambi Province can be seen from the nominal value tends to increase, as well as the number of business units, labor and business turnover. In 2013 MSMEs loans only increased by 12.34% or Rp. 8.772 trillion. Furthermore, the total MSMEs Credits in Jambi Province in 2014 grew by only 6.61% and 6.58% in 2015. The number of MSMEs business units in Jambi Province during the period of 2011-2015 increased but its growth tended to decline

The allocation of the development of micro, small and medium enterprises loans provided by commercial banks and rural banks in Jambi Province during the period of 2011-2015 showed a very slow increase compared to the total Credits channeled by commercial banks and rural banks, the fact can be seen from the MSMEs credit ratio loans provided by Commercial Banks and rural bank (*Bank Perkreditan Rakyat - BPR*).

From the description above shows that there is a gap on one side of the development unit MSMEs business in Jambi province is likely to increase, the role of MSMEs is very large in employment and turnover of MSMEs, on the other hand the ratio of credit absorbed by MSMEs is very small when compared to total loans Commercial Banks and BPR. The limitation of MSMEs in accessing bank credit occurred due to several reasons, such as lack of information about potential MSMEs, high interest rates, high transaction costs per customer, and the perceived lack of MSMEs in terms, capital, technology, management, marketing so that these MSMEs are not bankable or are not eligible for credit. From the conditions or description above, the purpose of this study is to analyze the factors that influence the taking of credit to MSMEs in Jambi Province.

REVIEW OF LITERATURE

The behavior of MSMEs in accessing bank credit is inseparable from understanding the behavior of household users of credit. economic behavior of household can be seen in terms of decision making based on the role of the household in making economic decisions. In making economic decisions households can be divided into two, namely single roles and multiple roles.

In a household model that has a single role, households are only producers or consumers. While the model household with multiple roles that households act as producers and consumers. According to Nakajima (1986), household models with multiple roles are more realistic because in reality small businesses in developing countries are generally producers and consumers.

The economic model of household decision making was first introduced by Chayanov with the theory of maximizing household utility. In this theory, it is explained that household economic decisions relating to the number of family workers who carry out production activities to meet consumption needs by using the assumptions of work time and leisure (leisure). Becker (1976) also developed this model by assuming that household time allocation consisted of working time at home and relaxing.

Hiershleifer (1958) developed a household economic model used to analyze household behavior towards credit. Furthermore, Binary (1993) applied this model to analyze borrowing and saving household behavior in three villages in Sumedang district by using variables directly related to credit, savings, income and consumption.

The household economic model assumes that a household will maximize the utility of production activities, consumption and leisure activities (leisure). The utility functions are written as follows:

$$U = u (X_i, X_c, L_t, X_n)$$

Where :

- U = utility
- X_i = i factor input
- X_c = service goods and consumption
- L_t = leisure time
- X_n = other factor
- u = functional relationship

To increase the utility of the above three activities, namely from U to U*, in general households often face liquidity constraints. To increase its liquidity, the household choice is to choose credit with the assumption that before deciding to take credit, the household has considered business risk and uncertainty.

Additional credit obtained by households is intended to increase satisfaction (utility), so the above equation can be written as follows:

$$U^* = u (X_i, X_c, L_t, K, X_n)$$

where: K is the amount of credit taken.

If the credit taken has a significant effect on changes in production, the constraints on production will change. This change is caused by the inclusion of a credit variable (K) as one of the factors in production, so that the production constraint equation uses credit as follows:

$$Q = q (X_i, L_w, K)$$

Where :

- Q = output of goods and services
- X_i = I factor input
- L_w = working hours used

Credit is a financial facility that allows a person or business entity to borrow money to buy a product and repay it within a specified period of time. In the credit market there are two interacting forces namely credit supply and demand. There are some people who don't want to apply for credit because they don't need credit or because people are reluctant to credit risk (risk averse). Knowledge of this character is very important for banks to help analyze whether credit will be given or not.

Research on credit access and its determinants by households has been widely carried out. The determining factors that are reviewed are usually socio-economic factors that affect households to access credit. Li, Gan & Hu (2011), Farida (2015) included demographic factors (age, gender, education, family size), socio-economic factors (assets, income, farmland size), family member dependency ratio (family ratio), the head of the household concurrently as a worker (self-employment), family members work in an office (official worker), bank share holder, ownership of savings) and other factors such as location, distance, attitude of the head of the household towards debt (attitude toward debt), and access to other types of credit (alternative credit).

According to Kausar (2013) that the factors that influence the demand for microcredit in Pakistan, first is the interest rate variable, both access limitations and the absence of available information, the three transaction cost variables then economic

conditions, gender differences and credibility of credit providers as well as factors government.

Based on the research of Nuswantara (2012) that the existence of other lenders (the number of banks and non-banks, the type of credit scheme) also affects the demand for credit. The more number of banks and the types of loans offered will make the credit market increasingly competitive, so the credit interest rate is also expected to be competitive. Competitive credit market structure will encourage a reduction in credit interest rates in a region.

Messah & Wangai (2011) examined the factors that influence the demand for credit in small businesses in Meru Central District, Kenya concluded that the variables of age, gender, education, income, and interest rates have a significant relationship to the decision to take credit, while the number of dependents, and business attributes are not significant. According to Abdullah, Bilau, Ajagbe, & Bustani (2012), the factors that influence the choice of credit from formal or informal sources borrowed by small businesses in Oyo, Nigeria are age variables, membership composition, asset value, and education. C.O. Research Anyiro and B.N. Oriaku (2011) also examines access to micro-credit for smallholders in terms of socio-economic factors in the country of Abia, Nigeria, a case study of the Abia State, Uturu (ASUMFB) Micro Finance Bank.

Furthermore, Azriani (2014) analyzed the accessibility factors in formal financing sources which were seen from their eligibility to credit, employers' education and the ability to provide collateral. This can be seen from the education factor and the ownership of land letters that significantly affect the accessibility of non-food and household income from formal financing sources. In addition, the age and ownership position in the business that describes the ability to obtain information and networking as well as the wealth that is owned also affects the accessibility of non-food SCE entrepreneurs in formal funding sources.

RESEARCH METHODS

The sample in this study was taken from the target population, namely MSMEs in Jambi Province as many as 81,979 business units. From the total population, there will be a sample of 276 respondents in several districts/cities based on regional representation, namely Tanjung Jabung Timur Regency and Tanjung Jabung Barat Regency representing the eastern region, Bungo Regency representing the central part, Merangin Regency and Kerinci Regency representing the western region and the City Jambi as the capital of Jambi Province.

Given the extent of the regency/city area and the uneven distribution of the population, the sampling was chosen based on the most MSMEs production centers in each region. The sampling technique used was purposive sampling. From a sample of 276 respondents, there were 113 MSMEs who did not take credit and 163 business people who took MSMEs loans.

To analyze the factors that influence business actors in taking MSMEs loans, Binary Logit Regression analysis tools are used. Juanda (2009) explains to predict multiple logistic regression models with k-1 independent variables, logistic regression models are formed by stating the value of P (Y = 1 | x | = as P (x) then logit from the regression model double logistics:

$$\text{Ln}\left(\frac{P_i}{1-P_i}\right) = Z_i = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + \dots + \beta_k X_{ki} \dots\dots\dots(1)$$

and the double logistic regression model:

3 = High (more than Rp.2,000,000 / week)
 $\beta_1, \dots, \beta_{10}$ The coefficient measures changes in the probability of logistics when there is a change in one unit of X_i .

The logit model estimation is carried out by the maximum likelihood method. The coefficient interpretation for the binary logistic regression model can be done using the odds ratio value. Odd ratio can be defined as the number of times the probability of choice 1 among individuals with $x = 1$ compared between individuals with $x = 0$. The Odd ratio is as follows: (Juanda, 2009)

$$\Psi = \frac{e^{\alpha+\beta}/(1+e^{\alpha+\beta})}{1/(1+e^{\alpha+\beta})} / \frac{e^{\alpha}/(1+e^{\alpha})}{1/(1+e^{\alpha})} = e^{\beta} \dots\dots\dots(5)$$

RESULTS AND DISCUSSION

Characteristics of households for micro, small and medium enterprises

The majority of MSMEs in Jambi Province were women, namely 54.0% and the remaining 46% were male. The MSMEs who use credit are 62.33% and 37.67% who do not access credit. Of the total of business actors who obtained credit there were 39.3% of female entrepreneurs who had obtained access to credit loans from financial institutions and 60.7% were male business actors.

The distribution of MSMEs actors who took credit based on their education level was dominated by high school graduates and those with the same percentage as 45.33%, the second distribution was 16.44% of graduates who graduated (S1) from the total respondents who took credit. Judging from his educational background, there have been many who think that the education of MSMEs actor is low, namely dropouts/junior high school graduates and it turns out that perception is wrong, the high level of education is an opportunity for the government to develop small and medium micro businesses, the higher the level of education it makes it easier for businesses to receive new information and also influence decision making and can read business opportunities.

The number of MSMEs actors who had attended entrepreneurship training was 62%, and the remaining 38% MSMEs actors had never participated in entrepreneurship training, there were various types of entrepreneurship training obtained by MSMEs in Jambi Province, including training related to product processing, marketing , financial reports and accounting, how to make business licenses, AMT, and management of the training aimed at improving the ability of MSMEs actors.

In general, most MSMEs actors have side jobs (66.67%) and the remaining 33.33% do not have a side job. The age of MSMEs actors in Jambi Province in this study were mostly between 41 years and 50 years old, reaching 35.33% of the total MSMEs. Micro, small and medium entrepreneurs who are less than 30 have 51 respondents consisting of 62.7% of respondents who took credit and respondents who did not take MSMEs credit (37.3%). Furthermore, the average working hours per week for MSMEs actors in Jambi Province are 44.75 hours per week. The average working hours are above the working hours set by the 2003 Manpower Act.

Determinant of micro, small and medium enterprises on carrying out a credit loan in Jambi Province

This study uses logit regression analysis to analyze the factors that influence the taking of MSMEs credit in micro, small and medium enterprises in Jambi Province. As the dependent variable the value of the category used is denoted as $Y = 1$ stating that the business actor who takes the credit and $Y = 0$ states the event that the business actor

does not take credit. The independent variable is used to look at the factors that influence business actors in taking credit, namely based on household characteristics, individual characteristics and business characteristics. The factors of household characteristics include household expenses, working partners, and side jobs. Individual characteristics are: age and level of education. While the business characteristics consist of: working hours, number of workers, length of business and ownership of a bank account.

To test whether all explanatory variables jointly influence the dependent variable, a likelihood ratio (LR) is used. The LR statistical value follows the chi square distribution (χ^2) with the degree of freedom (df) as many explanatory variables not including constants. If the value of chi square (χ^2) is greater than the critical value, then all explanatory variables together affect the dependent variable. The hypothesis for assessing fit models is:

Ho: The model that is hypothesized to fit from the data

Ha: The model hypothesized is not fit from the data

Decision rejects Ho if $\chi^2 > \chi^2_{(\alpha, 1-p-1)}$. From the results of the Omnibus Test of Model Coefficients, the Chi Square value was 128,293 degree of freedom (df) = 15 with a significant probability (p) = 0,000. It can be concluded that the independent variables in the model jointly influence business actors in taking MSME credits or not taking credit.

Table 1 shows that the statistical value of Hosmer and Lemeshow's Goodness of Fit is 6,110 with a significant probability of 0.635 which is far above 0.5. Thus it can be concluded that the model is acceptable.

Table 1. Test of overall fit models for MSMEs credit taking models

	Chi-square	DF	Sig.
Omnibus Test of Model Coefficients	128,293	15	.000
Hosmer and Lemeshow Test	6,110	8	.635

The 2x2 classification table in Table.2 shows how well the model classifies cases into two groups, both for businesses that take MSMEs credits and for businesses that do not take credit. The overall classification accuracy is 81,2%. It can be concluded that the accuracy of the model in predicting the probability of businesses taking MSMEs credits is relatively greater compared to businesses that do not take MSMEs credits.

Table 2. 2x2 classification of MSMEs credit taking models in Jambi Province

	Observed	Predicted		Percentage Correct
		Taking credit		
		No	Yes	
Taking credit	No	79	34	69,9
	Yes	18	145	89,0
Overall Percentage				81,2

Parameter estimation and partial test in binary logit model for factors that influence business actors in obtaining MSMEs credit are presented in Table 3.

Side jobs (DPS)

The value of the coefficient in the model for the side job variable shows a significant effect. Respondents who have side jobs have the opportunity to take MSMEs credit of $e^{1,173} = 3,233$ times greater than respondents who do not have side jobs. In addition to carrying out its business activities, several MSMEs have side jobs such as: Civil Servants/teachers, honorary workers, informal workers, farmers, trade, gardening,

laborers, and security guards. In some types of businesses such as batik, there are some respondents who have jobs as civil servants. In general, they are business owners who employ workers in their batik business. Business people have a flexible time in conducting business activities, so that some of them have free time to increase income through side jobs.

Table 3. Variables in the equation

Variable	B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I.for EXP(B)	
							Lower	Upper
DPS(1)	1,173	,353	11,082	1	,001	3,233	1,620	6,452
JTK	-,003	,118	,000	1	,983	,997	,791	1,258
JKR			5,306	2	,070			
JKR(1)	,407	,482	,714	1	,398	1,502	,584	3,862
JKR(2)	,991	,443	4,991	1	,025	2,693	1,129	6,422
DPB(1)	-,754	,364	4,289	1	,038	,470	,230	,960
DGE(1)	-,874	,367	5,662	1	,017	,417	,203	,857
EDU			7,434	3	,059			
EDU(1)	,208	,554	,141	1	,708	1,231	,416	3,645
EDU(2)	1,085	,503	4,660	1	,031	2,960	1,105	7,927
EDU(3)	1,101	,549	4,025	1	,045	3,006	1,026	8,811
TIME			9,164	2	,010			
TIME(1)	1,080	,391	7,627	1	,006	2,943	1,368	6,333
TIME(2)	1,106	,457	5,873	1	,015	3,023	1,236	7,398
AGE	,016	,016	,998	1	,318	1,017	,984	1,050
CONS			14,223	2	,001			
CONS(1)	,557	,430	1,682	1	,195	1,746	,752	4,055
CONS(2)	1,975	,543	13,239	1	,000	7,208	2,487	20,888
DREK(1)	2,267	,468	23,496	1	,000	9,649	3,859	24,131
Constant	-4,655	1,229	14,341	1	,000	,010		

Number of workers (JTK)

In general, the increase in business activities will be accompanied by an increase in the number of labor and capital. The greater the activity of a business, the greater the need for capital and labor. But the coefficient value for the number of workers does not show significant. This means that there is no difference in the probability of businesses taking credit with those who do not take credit in the workforce. In MSMEs households there are special characteristics where business owners as well as workers.

Working hours (JKR)

In terms of working hours (JKR1), there is no difference in the probability of taking credit between business actors who have medium working hours (25-45 hours/week) compared to those who have low working hours (<25 hours/week). However, the odds ratio for variables (JKR2) is 2,693. It means that the tendency of MSMEs who have high working hours above 45 hours per week has a 2,693 times greater chance of taking credit compared to business people who have low working hours (less than 20 hour). The higher a person's working hours, the higher the level of productivity. High productivity will affect the income received.

Working partners (DPB)

The value of Odd ratio is 0.470 in the working pair variable indicating the tendency of MSMEs actors who have working partners have the opportunity to take credit by 0.470 times compared to respondents who have partners who do not work. This means that the probability of making credit decisions for MSMEs actors who have

working partners is smaller than MSMEs actors who have partners who do not work. In general, businesses that have a working partner, they will tend to use their own capital first in business activities.

Gender (DGE)

In this study the value for the female sex variable = 1, and male = 0. The result of the odd ratio can be interpreted as the tendency of female entrepreneurs in taking credit is 0.417 times compared to men. This means that the chances of female entrepreneurs in taking credit are lower than men. The low chance of women in taking credit is because women lack assets that can be used as collateral to get formal credit. In addition, ownership of assets in married women is usually controlled and in the name of the husband as the head of the family. This study is in line with what has been done by Mesah and Wangai (2013), Ololade (2013) and Nkuah, et, al (2013) where business owners of male sex have greater accessibility than female owners.

Age (AGE)

The age variable is not significant, meaning that there is no difference between business actors who take credit with businesses that do not take credit based on their age level. Age is not a consideration from the credit provider, as long as the business actor's age is still in the productive age range. However, age is a very important thing in describing the maturity of a person's productivity level.

Education level (EDU)

In the context of education (the basic category is a business actor graduating from elementary school). There is no difference between elementary school and junior high school education to take loans. But there is a difference between high school and undergraduate. The odds ratio shows that business actors with high school education have a probability of 2,960 times higher than those with elementary education. This probability is even higher for business people with undergraduate education, with a probability ratio (odds ratio) of 3,006.

Education is an important factor in accessing bank credit, because to apply for credit at formal financing sources there are procedures and credit contracts that must be understood by business actors. This is in line with research conducted by Pandula (2011) which states that education is an important factor in accessing credit, because educated business actors have more ability in making business plans and financial information as well as building relationships with financial institutions.

Long established business variables

The long established business variable is divided into three groups with the basic categories of business actors having a business duration of less than 10 years. The results of the study showed that there were significant differences in the decisions of business people in taking credit based on the business years. Opportunities for businesses to take credit will be greater along with the increase in business years. The value of the odds ratio of 2,943 can be interpreted as business actors who have 10-20 years of business having a greater chance of taking credit compared to business actors who have a business duration of less than 10 years. In the old category of business years over 20 years also shows a greater opportunity that is 3.023 times compared to businesses that are less than 10 years. Most business players who are optimistic that they can market their products, they will propose capital loans to banking institutions for the development of their businesses. This research is in line with Musamali and Tarus (2013) which states that the duration of business influences the ability of MSMEs to access and participate in financial institutions.

Account ownership (DREK)

The ownership of the business actor's account at the Bank has a significant effect on the factor of taking credit. Business actors who have a bank account have an opportunity of 9,649 times for decisions to take credit compared to business actors that do not have accounts. In general, business actors who have accounts at the Bank will get quick and complete access to information compared to businesses that do not have bank accounts. Relationship factors affect the ability of small businesses to access bank credit.

Household expenditure (CONS)

The higher household consumption needs, the behavior of MSME actors tends to take credit. Household expenditure is divided into three categories (with the basic category of low household expenditure <Rp.1,000,000). There is no difference between low and medium household expenditure in taking loans. However, there is a difference in high household expenditure, with an odds ratio of 7,208. This means that MSMEs actors with high household expenditures have a probability of 7,208 times greater than the MSMEs actors of low household expenditure in taking loans. In the household economy of micro, small and medium enterprises, business actors have a dual role, namely being able to become consumers as well as producers. As consumers there are times when they need funds to meet other needs such as education and health expenses, while the income they earn is not enough. On the other hand they need capital to sustain business activities. Therefore, to fulfill capital adequacy, the business actors will usually propose capital loans in the form of loans.

Economic analysis

One problem that is still often faced by MSMEs is the capital problem which is a critical factor for micro, small and medium enterprises, especially for the fulfillment of working capital and investment capital in business development. Most micro, small and medium enterprises are unable to get credit from banks because they do not meet the requirements to be eligible for credit. Capital is one of the inputs used in the production process to produce a certain amount of output. In starting a business, MSMEs actors generally obtain capital originating from various sources such as personal savings, assistance from relatives or from informal sources in order to fund production activities. withdrawal of credit from banks.

There are still many micro, small and medium enterprises entrepreneurs who have not obtained credit access from the banking sector. The low access to credit for banks is not only because these MSMEs are not yet bankable or do not have sufficient collateral, but there are other factors that also affect business people in making credit decisions.

The decision to take credit by business actors is inseparable from the influence of individual characteristics, household characteristics and business characteristics of the business actors themselves. Therefore the empowerment of micro, small and medium enterprises needs to be improved through improving the quality of human resources. Human resources is one of the most important factors that determine the success or failure of the objectives of a business activity. Unprofessional MSMEs culture will be an obstacle in improving the quality of human resources, whereas reliable and quality human resources can help micro, small and medium enterprises in absorbing market knowledge and needs and increasing the confidence of banks or other financial institutions in providing credit for working capital.

Some of the characteristics inherent in most MSMEs, such as the low quality of human resources working in the MSMEs sector, both in terms of formal education,

knowledge and skill levels will affect business management, low labor productivity, low levels of salaries and wages, employing female workers more than men and the quality of the goods produced is less competitive. Therefore there is a need to continue to improve the quality of human resources by emphasizing individual characteristics and household characteristics of micro, small and medium enterprises.

The results of this study also support from several studies that have been carried out by Pandula (2011); Nguyen and Luu (2013) who recommend that the characteristics of business owners become one of the determinants in making credit decisions in small businesses. Furthermore Oriakhi and Onemolease (2012) state that demographic factors are one of the factors that determine a person's participation in taking credit. Another study that supports the results of this study was also conducted by Machira, Njati, Thiane and Huka (2014) in their study of accessibility of female SME entrepreneurs in Kenya.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

Most of the MSMEs actors are women. The average education level of MSMEs actors are graduated from high school, with the average age being in productive age.

Factors that influence the taking of credit to business actors are side jobs, working hours, working partners, sex, education, length of business, account ownership and household expenditure variables. As for the age variable, and the number of workers is not significant for the decision to take credits in Jambi Province. The behavior of taking credit is not only determined by the characteristics of the business, but also determined by the individual characteristics and characteristics of the household of MSMEs actors.

Recommendations

Efforts to increase the participation of business people in credit can be done by building the character of MSMEs actors (household characteristics and individual characteristics) through improving the household economy. Human resources for business people need to be improved through training and guidance for MSMEs both in terms of management and business as well as information about credit access and the market periodically.

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Modern problems of reproduction of public health of the population

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Abstract

The study is based on the development of the basic provisions for the implementation of sustainable development, namely one of its goals: “Overcoming poverty in all its forms”, which were approved in 2015 at the UN Summit on Sustainable Development. Reproduction of the public health of the population is the basis of the mechanism for the prevention of poverty in the territories, presented in doctoral dissertation Martynovych Nataly. Also, modern problems of reproduction of public health of the population form the conceptual foundations of the applied state theme “Economic and legal support of the strategic development of newly formed territorial communities”. This topic was approved by the Decree of the Bureau of the Department of Economics of the National Academy of Sciences of Ukraine and is carried out by the staff of the department of problems of interregional cooperation of the Institute of Economic and Legal Research of the NAS of Ukraine Martynovych Nataly, Boichenko Elina. The purpose of the research is to determine by the empirical way modern problems of reproduction of public health of the population and the development of comprehensive measures to overcome them. The findings showed an integral assessment of the state of public health of the population was carried out, as a result of which it was established that only three-quarters of the population of Ukraine can be considered healthy. Empirically, an increase in the deficit of the average life expectancy of the population is determined, and the main reasons for such dynamics are also indicated. The proposed measures to promote an increase in the life expectancy of the population of the region.

Keywords: *health, life expectancy, mortality, morbidity, medical, integral assessment.*

JEL classification : I15, I18,

INTRODUCTION

One of the most important indicators of socio-economic development of the state is the condition of public health of the population. The ability of a person to live a long life and maintain his health depends on socio-economic factors such as material conditions of life, the level of development of health care, as well as on the man-made load on the natural environment. The state of human health determines the future and is regarded as the highest social value of society. Modern crisis phenomena in the

domestic economy have a negative impact on the processes of development of the health sector, the effectiveness of which depends on the health of citizens. The medical sector, which receives funding from the budget, is characterized by low wages of medical personnel, lack of funds for the renewal of medical equipment and the purchase of medicines, and other problems that prevent the possibility of solving the issue of providing medical care to the population in full. The problem of health deteriorating is also exacerbated by the declining living standards of most population and the man-caused burden on the natural environment. Thus, the health condition of the population of the state can be considered not only as one of the most important indicators of the quality of life, but also as one of the important indicators of its socio-economic development.

The purpose of the study is to determine empirically the modern problems of reproduction of the public health of the population and to develop comprehensive measures to overcome them. Based on the objective of the study, the following tasks were set and solved: 1) To establish the main causes of negative trends in the reproduction of public health; 2) Develop a set of measures to overcome the negative manifestations in the reproduction of the public health of the population.

METHODOLOGY

The methodological basis of the study is primarily a set of methods of scientific knowledge, general scientific and special research methods. The theoretical basis was the fundamental principles of economic theory, regional economics, sociology, strategic management of the socio-economic development of regions, scientific works of domestic and foreign scientists concerning the production of public health. For example, the research of the health of the population and its influence on the current demographic situation are depicted in the works of scientists (Borodavchenko, Kononova., & Pashchenko, 1990; Libanova, 2014). However, despite a significant number of scientific publications and achievements in this field, the individual aspects of this multifaceted problem remain controversial and require further study.

To form the definition of the “reproduction of public health of the population” category, the judgments of such authors as: (Pérez, Ravasi, Figuera, Grinsztejn, Kamb, Sued, & Massimo, 2016) were analyzed; (Etienne 2017); (Hirani & Richter, 2017); (Chiappero-Martinetti 2014); (Hall, Taylor, & Barnes, 2013), (Arah, 2009) and others. Summarizing the scientific points of view came to the conclusion that under the reproduction of public health of the population should be understood the process of continuous renewal and preservation of the viability of the population.

The public health of the population was assessed using a synthetic method that combines the results obtained during the analysis and contributes to determining the strength (measure) of intensity and the direction (trend) of the influence of some components of the social life of the population on others. For example, the synthetic method allows to determine the strength of the influence of population reproduction on the processes of formation of labor resources or the level of public health. Or, on the contrary, to determine the strength and direction of the impact of the components of the reproduction of public health on the formation, distribution, redistribution and use of labor resources, the number and age structure of the population, and the like. This allowed us to identify negative processes and phenomena in reproduction. The list of

indicators, with the help of which the state of public health was assessed, is given in Table 1.

Table 1. The matrix of the selection of indicators for assessing the reproduction of the public health

Indicators	Methodical tool kit
Mortality by main reasons, from some external causes, children under the age of 1	Assessment of the level of public health of the population
Number of doctors; number of middle medical personnel	Mortality structure of the population; morbidity; infectious disease; hospitalization by classes, groups and forms of diseases for certain groups of the population; average; modal and median age of the deceased.
Number of workers employed in areas with harmful working conditions; disabled people	Mortality rates: general, special (differentiated), age, individually for each sex, infants, children under the age of 5, stillbirth, maternal, for certain cause of death. The level of age-related mortality; the proportion of premature deaths in the total mortality of the population; index table mortality of men or women.
Number of hospitals; outpatient clinics and beds; planned capacity of outpatient clinics.	Birth rate: general, special, total, age. The ratio of the number of deaths and births.
Primary incidence (frequency of diseases), seasonal, infectious, according to medical examinations; by classes of diseases; the incidence of certain infectious diseases, active tuberculosis, venereal diseases, mental and behavioral disorders, HIV-infected people and AIDS patients; disability.	Mortality rate: total; by separate groups and forms of illness; the proportion of individual groups of diseases, infectious diseases, the incidence rate of different population groups.
The number of injured and injured in production, by city and district.	Level of hospitalization of the population of age, sex, professional; average length of stay in a hospital for a particular disease (group and class of disease); multiplicity and hospitalization – by separate forms, groups and classes of diseases for certain groups of the population; the capacity of outpatient clinics.

The assessment of reproduction of public health was carried out on the basis of a systematic approach, the use of which is justified by the need to determine the impact of both external and internal factors of influence on the health of the individual.

The analytical basis was compiled by official statistical information obtained from publications of the State Statistics Service of Ukraine. The following materials were used: statistical yearbook ‘Statistical Yearbook of Ukraine’, statistical collections ‘Ukraine in Figures’, ‘The number of available population of Ukraine’, ‘Distribution of permanent population of Ukraine by sex and age’, demographic yearbook ‘Population of Ukraine’, statistical bulletin ‘Healthcare institutions and morbidity of the population

of Ukraine', 'Traumas in the workplace', 'Birth rate tables, mortality and average life expectancy', as well as some information from the official website of the State service of statistics of Ukraine.

RESEARCH RESULTS

According to previous theoretical studies, it has been established that the notion of 'individual health' is not clearly determined, but is associated with a multitude of factors affecting a person. Human health is one of the most important factors in the conditions of its existence. The state of public health of the population significantly influences the dynamics of economic development of the country (or its separate region) through the impact on the quality of human resources. In this context, the 'need for health' already goes beyond the scope of the individual and is of a general nature – 'public health', which is the property of the state and serves as an indispensable condition for the successful use of its productive forces (Glushakov 2011). Based on the above, let us note that the reproduction of the public health should be understood as the process of continuous renewal and preservation of the viability of the population.

The assessment of the reproduction of the public health should be considered as a process consisting of two interconnected components. Firstly, the assessment allows a comprehensive study of trends and patterns of development of the health of the population. At the same time, living conditions, industrial relations, as a rule, are crucial for the health of people. Secondly, the study cannot be considered objective without taking into account trends in the development of the health care system, namely, the forms and methods of work of various medical institutions, the quality of medical care, etc.

Obtaining an assessment of reproduction of the public health of the population is possible on the basis of a systematic approach, the use of which is justified by the need to determine the impact of both external and internal factors of action on the state of health of the individual. The external ones include those that are formed depending on the level of economic and social development of society. These should include the financing of health facilities, the development of the diagnostic system, the prevention and treatment of diseases, the level of technology-related loading of the territory, etc. The internal factors are physiological features of the human body such as age, sex, the presence of certain types of diseases, hereditary predisposition to disease; provision of high-quality food products to the population; social status, education, occupation of the individual, conditions of his work, cultural level, etc.

As it has been already stated, the health care system of Ukraine is based mainly on the state funding. The most important problem in this branch is its underfunding, which does not allow providing the volumes of medical care that are necessary for citizens. Medical institutions are the providers of medical services, the quantity and quality of which is directly dependent on the amount of funding. It should be noted that consumers of health services have different health conditions, different attitudes to the prevention and treatment of diseases, and unequal opportunities for paying medical care.

The analysis of the change in the number of physicians of all specialties suggests that since 1990 (Mineva 2003) in Ukraine their number has decreased by 17.6%, from 227 thousand people to 187 thousand people in 2016, that is, 40 thousand people. But it should be noted that, on the basis of 10 thousand people, the reduction of doctors almost have not changed and makes 44 people. Significant changes can be noted in the

structure of the average medical staff, the number of which for the analyzed period sharply decreased – by 240 thousand people (almost 40%), and this trend is observed throughout the analyzed period. Also, there is a reduction of average medical personnel per 10 thousand population by 31 persons (compared with 1990). The number of hospital beds has decreased almost twice – from 700 thousand units to 315 thousand units for the period of 1990 – 2016. For the population of 10 thousand, this reduction was 45.2% (61.2 thousand units).

The experience of the developed countries regarding the containment of health care expenditures shows the reduction of the share of doctors in the total number of employed, delegating part of their duties to the lower skilled workers (nurses, medical assistants and so on). However, as it has already been noted, in Ukraine during the analyzed period there is a decrease in the number of not only doctors, but also middle medical personnel. Thus, there is an increase in the burden on health workers in the country, which, in turn, can affect the quantity and quality of services rendered.

The next problem of reproduction of the public health is the high mortality rate of the Ukrainian population, especially in the working age, which affects the expected life expectancy of the population and becomes one of the urgent problems of society. On that basis, modern studies of the structure and dynamics of the life expectancy of the population, as well as the identification of the reasons influencing it, are of particular importance.

The expected life expectancy at birth is one of the main integral indicators that characterizes the health status and causes of mortality in a certain area, quality of life and the level of health care. UN selection of this component as one of the three components that characterize the welfare of the population, due to the fact that the average life expectancy depends on the conditions of existence of society.

In the beginning of 2015, Ukraine ranked 148th out of 192 countries in terms of life expectancy (71.5 years old). So, the deficit of the expected life expectancy at birth was 18.02 years old, that is, there is a backwardness in this category from economically prosperous states for almost 18 years. For life expectancy, Ukraine was even ahead of underdeveloped and developing countries such as Ecuador (82nd place, 76.56 years old), Libya (88th place, 76.26 years old), Egypt (126th place, 73.70 years old), Uzbekistan (128th place, 73.55 years old), Brazil (129th place, 73.53 years old) and dozens of others (Health economics 2008).

The main reasons for such a situation are the low level and unfavorable living and working conditions of a large part of the population of Ukraine, low efficiency of the existing health care system, pollution of a large part of the territory by industrial waste, prevalence of bad habits and neglect of healthy lifestyle standards.

The key problems of the health of the population of Ukraine are related to the morbidity and mortality of the so-called ‘socially dangerous diseases’ as AIDS (HIV) and tuberculosis, which reflect, first of all, the way and conditions of a person’s life. Despite the fact that the number of patients with active tuberculosis has a stable tendency to decrease from 31.3 thousand people in 2010 to 23.3 thousand people in 2016, the total number of patients remains very significant. Every year, on average, about 20 thousand patients with tuberculosis are found in Ukraine. Most often people of working age and reproductive age are affected. This negative tendency can be explained by the deterioration of the conditions of treatment and complications of tuberculosis.

The number of people infected with HIV and AIDS patients who are registered in medical institutions of Ukraine in 2016 is 133.1 and 38.8 thousand persons, respectively (Ukraine in figures in 2017).

It should be noted that the health of the population is affected by the consumption of alcoholic beverages, narcotic drugs, as well as tobacco products. According to the analysis of the consumption of alcoholic beverages in Ukraine, it has been established that there is a negative tendency to increase their consumption volumes. This is especially true of the consumption of strong alcoholic beverages, which have the most harmful effects on the health of the population and lead to negative social and economic consequences. Thus, for the purchase of alcoholic beverages and tobacco products, households spend 4.7% of the total cash expenditures per month, for example, about 2.7% spend on the health care of the household, 2.3% – on recreation and culture. It should also be taken into account the fact that there is no direct statistics on the consumption of alcohol and narcotic drugs in Ukraine, such an assessment can only be made on the basis of an analysis of the volume of registered alcohol sales or according to relevant sociological studies. The reliability of official statistical reporting is questionable, since it does not reflect the true capacity of the Ukrainian alcohol market, the size of which is much larger than the declared. The corresponding expert estimates of alcohol consumption among Ukrainians vary by an average of 10 – 13 liters per capita. It is worth remembering that, according to the WHO, alcohol consumption of more than 8 liters per year is dangerous and detrimental to health. So, the increase in average per capita consumption of alcohol by 1 liter adds 8 men and 1 female suicide per 100 thousand men and 100 thousand women. The population with alcohol addiction has the risk of suicide 9 times higher than for the rest (Ukraine in figures in 2008).

In Ukraine, during the 90's of the twentieth century, the rate of drug addiction and substance abuse increased fourfold, in addition, the number of patients (per 100 thousand people) who are being registered about mental and behavioral disorders due to the use of narcotic and other psychoactive substances increased more than three times. Thus, the spread of drug addiction in Ukraine remains, along with alcoholism, one of the most important and serious problems. If we take into account the fact that the official statistics do not give a real picture of the drug use by the population, the scale of this problem in the country is not defined. Drug use leads not only to the physical and social degradation of a person, but also poses a threat to the negative consequences for society as a whole. Among them, one can identify such as raising the level of crime, increasing the number of serious and especially grave crimes; the spread of a wide range of concomitant diseases (hepatitis, tuberculosis, HIV, AIDS, which requires the state to increase the cost of prevention and treatment of these diseases).

Other illnesses (HIV, hepatitis viruses, etc.) are common among drug addicts, which considerably decrease the life expectancy of a person. It has been established that the average life expectancy of a drug addict used by heroin does not exceed 7 years since the beginning of drug addiction. In fact, the vast majority of them are doomed to early death.

It is also important to consider that the health of the individual changes over time. With age there is a process of accumulation of certain types of diseases, which are caused by the way of human life, working conditions, physiological characteristics of the human body and other factors. Consequently, its support requires appropriate investments, that is, the cost of medical services.

For the integral assessment of the state of public health, the following formula is proposed:

$$I_3 = \left(1 - \frac{\sum_{i=1}^n k_n}{n} \right), (1)$$

where k_1 – the mortality rate of children under the age of 1;

k_2 – the mortality rate of the population for the main reasons, except mortality from accidents;

k_3 –rate of morbidity of the population;

k_4 – rate of patients who were registered in medical establishments with HIV and AIDS, malignant neoplasm, mental and behavioral disorders, active tuberculosis and sexually transmitted diseases

k_5 – rate of disability

An integrated assessment of the state of public health is given in Table 2.

Table 2. Integral assessment of the state of the public health of the population of Ukraine

Indicator	Years					
	1995	2000	2005	2010	2015	2016
Assessment of the state of public health of the population	0.853	0.848	0.846	0.842	0.844	0.844

Source: Ukraine in figures in 2017

Thus, according to the results of calculations, it can be stated that only three quarters of the population of Ukraine can be considered healthy.

As the level of reproduction of the public health of the population of the region, it is expedient to use the indicator of the average life expectancy at birth, which is one of the main integral indicators that characterizes the health status and causes of mortality of the population of a certain territory, quality of life and the level of medical care. The dynamics of the deficit index of the average life expectancy at birth can be considered a reflection of the efforts of society aimed at reducing mortality and improving the population.

The average expected life expectancy of a future life is calculated on the basis of mortality rates by mortality (or survival) tables. The indicator of the expected life expectancy at birth is calculated both for the entire population of the region (for women and men together), and separately. Determination of the deficit of the average life expectancy at birth as a result of mortality from the main and external causes allows to establish a change in the value of this indicator, provided that the complete elimination of mortality from a specific cause.

Changes in the reproduction of the public health of the population are manifested in the deficit of the average life expectancy associated with changes occurring in the social life of the regional society and the state of health of the individual. In order to determine the direction of change, such gradations of a qualitative state are highlighted: growth, stagnation, reduction. The results of quantification public health are shown in Table 3.

Table 3. Results of quantification of reproduction of public health of population of Ukraine.

Indicator	Trend model	Trend direction			Result	Consequences	
		Abbreviation	Stagnation	Growth			
Functioning of the health care system							
The number of physicians of all specialties, one thousand people	$y=241-4.509x$ $R^2=0.691$	+			Real danger	Increased deficiency of life expectancy at birth	
per 10 thousand inhabitants	$y=48.01-0.248x$ $R^2=1$	+					
Average number of medical personnel, one thousand people	$y=623.13-26.061x$ $R^2=0.952$	+			Real danger		
per 10 thousand inhabitants	$y=117.83-3.412x$ $R^2=0.965$	+					
Number of hospitals, one thousand institutions	$y=4.11-0.248x$ $R^2=0.963$	+			Real danger		
Number of hospitals, one thousand beds	$y=653-35.782x$ $R^2=0.803$	+			Real danger		
in the amount of 10 thousand inhabitants	$y=114.02-4.28x$ $R^2=0.724$	+					
Number of doctor's outpatient clinics establishments, one thousand institutions	$y=0.406x+6.27$ $R^2=0.735$			+	No danger		
The state of public health							
Population incidence, one thousand cases	$y=35.786-1.382.6x$ $R^2=0.654$	+			No danger		
per 100 thousand population	$y=68,271-481.51x$ $R^2=0.047$	+					
HIV-infected persons	$y=28.466x-21.213$ $R^2=0.923$			+	Real danger		
per 100 thousand population	$y=67.44x-58.773$ $R^2=0.935$			+			
AIDS patients, people	$y=7.89x-13.027$ $R^2=0.894$			+	Real danger		
per 1,000 inhabitants	$y=18.583x-31.607$ $R^2=0.885$			+			
Incidence of active tuberculosis, persons	$y=29,468-250.23x$ $R^2=0.005$			+	Real danger		
per 100 thousand inhabitants	$y=1.506x+56.513$ $R^2=0.039$			+			
Number of disabled people	$y=299.7-37.2x$ $R^2=0.891$	+			Real danger		
per 1,000 inhabitants	$y=51.1+0.9x$ $R^2=0.931$			+			
Mortality of children under the age of 1, one thousand persons	$y=3.68-0.36x$ $R^2=0.986$	+			No danger		
per 1,000 births	$y=13.38-0.74x$ $R^2=0.772$	+					

Thus, the negative trend of reproduction of the public health of the population is revealed that there is a problem situation in the state of the public health of the population, in financing and functioning of the health care system and social assistance. The consequences of the existence of these problems are an increase in the deficit of the expected life expectancy at birth, which characterizes the adverse development of population reproduction processes.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

The main causes of negative trends in the reproduction of the public health are the existing problems in the economic (income level of the population), social (living conditions) and environmental (state of the environment) development of the country. The formation of national tendencies depends on the individual (the individual's health), which is confirmed by an increase in the deficit of the average life expectancy;

Overcoming negative manifestations in the reproduction of the public health of the population requires the development of complex measures, such as the transition to new technological forms of production, which will help minimize the occurrence of man-made risks; development of innovative programs on immune prophylaxis, prevention of the spread of AIDS, early diagnosis of infectious and cancer diseases, reduction of cardiovascular diseases; strengthening the promotion of a healthy lifestyle through the formation of motivation for the population to preserve and strengthen health, etc.

All this will increase the life expectancy of the population of the region and the country as a whole.

Recommendations

Suggest that, as a first step, overcoming negative manifestations in the reproduction of public health of the population should be considered as a transition to new technological forms of production, which will help minimize the occurrence of technological risks; secondly, to develop innovative monoprophyllaxis programs that would help prevent the spread of AIDS, early diagnose infectious and oncological diseases, and reduce cardiovascular diseases; thirdly, to strengthen the promotion of healthy lifestyles through the formation of motivation among the population to preserve and promote health.

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Impact of population growth on Carbon Dioxide (CO₂) emission: empirical evidence from Nigeria

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Abstract

This paper seeks to examine the impact of population growth on carbon dioxide emission in Nigeria. Time series data from 1975 to 2016 was adopted. Variables such as population, affluence and technology were used as independent variables which were extracted from the IPAT equation. Econometric tools such as Ordinary Least Squares were adopted. The findings show that there is a positive association between CO₂ emission, population and technology whereas affluence has a negative relationship with CO₂. The study concluded that the population growth has a marginal impact on the level of CO₂ emission. The paper recommended that there is need for the government to adopt a climate friendly technology that will minimize the increasing CO₂ emission, improve on its GDP alongside controlling her population growth.

Keywords: *Population growth, Carbon dioxide, Technology, Affluence, GDP*

JEL Classification: I3, J1, Q5

INTRODUCTION

The world human population has been witnessing appreciable growth overtime which can be traced to the 18th century. The population has grown from 1 billion in 1804 to about 7.6 billion in 2018. i.e., a major spike in the population growth was recorded during the 20th Century when the world population grew from 1.65 billion to 6 billion. Though, regions that accounted for this figures (7.6 billion) are Asia (4.5 billion), Africa (1.2 billion), Europe (742 million), Latin America and the Caribbean (652 million), Northern America (368 million) and Oceania (41million). Subsequently, countries that are considered as top 10 (ten) with the highest population count are; China (1.4 billion), India (1.3 billion), United State of America (327 million), Indonesia (267 million), Brazil (211 million), Pakistan (202 million), Nigeria (197 million), Bangladesh (166 million), Russia (143 million) and Mexico (131 million). Thus, Nigeria is ranked as the 7th Top populated countries in the world (Worldometer, 2018). By 2050, the world population and that Nigeria is projected to reached 9.7 billion and 410 million respectively.

With these rapid increase in human population over the past three centuries, this has raised concerns among Government and Non-Governmental Organization (NGO's) that the planet may not be able to sustain the present or larger numbers of inhabitants. This is due to the fact that it is associated with many environmental problems such as rising levels of atmospheric carbon dioxide, global warming and pollution etc. In other

words, with a rising population it means more people, more demand for oil, gas, coal and other fuels mined or drilled from below the earth surface and when burnt, spew enough carbon dioxide into the atmosphere to trap warm air inside like a Green house (Scientificamerican,2018). Other social and economic problems associated are; unemployment problem, fall in per capita income, balance of payment problems, increase in price level, pressure on social services, increased demand for resources such as fresh water and food, starvation and malnutrition, consumption of natural resources (such as fossil fuels) faster than the rate of regeneration, and deterioration in living conditions etc.

Despite these numerous problems that are connected with rising population, this paper is limited to the study of atmospheric carbon dioxide emission. Atmospheric carbon dioxide which is also called Carbon acid gas, carbonic anhydrite is a colorless, odorless incombustible gas present in the atmosphere formed during respiration, usually obtained from coal, coke or natural gas combustion, from carbohydrates by fermentation, by reaction of acid with limestone or other carbonates or naturally from springs used extensively in industry as dry ice or carbon dioxide snow in carbonated beverages, fire extinguishers etc (Dictionary.com, 2018).

However, the total world carbon dioxide as at 2016 stood at 35, 753,30 (kt). China, USA, India, Russia and Japan are the world’s largest emitters of CO₂ emission which accounted for 51% of the total world population, 65% of the Global Gross Domestic Product, 67% of the total global GHGs (Janssens-Maenhout et al, 2017). Below are the top emitters of CO₂ globally as at the end of 2016.

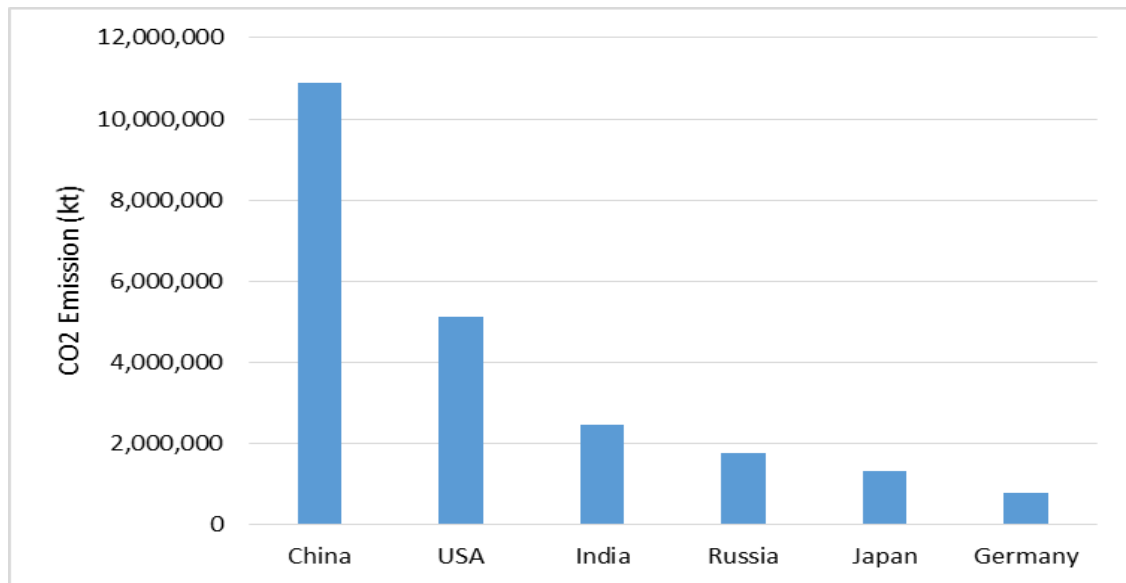


Figure 1: Top emitters of CO₂
 Source: Janssens-Maenhout et al., 2017

Figure 1 depicts that china is still the top emitters of CO₂ and also still considered as the country with the highest population. Although, Nigeria is been ranked the 7th highest populated country in the world but it cannot be traced among the 20th highest emitters of CO₂. This scenario has raised some pertinent question as to what factors could be responsible for this performance? And also this has contravene existing literatures such as the works of Engleman (1994); Hamilton & Turton (2002); Gregory & Oded (2016); Shi (2001); Inmaculada, Aurelia & Rafael (2006); Martinez-Zarzoso

(2008) Sanglimsuwan (2012) and Shi (2003) which they stressed a direct relationship between population growth and CO₂ emission. It is against this vacuum that this study was carried out.

LITERATURE REVIEW

Shi (2001) in his study found a direct relationship between population changes and carbon dioxide emissions in 93 countries over a period from 1975-1996. Similarly, Cole & Neumayer (2004) considered 86 countries during the period from 1975-1998 and they found a positive link between CO₂ emissions and a set of explanatory variables including population, urbanization rate, Impact-Population Affluence-Technology, energy intensity and smaller household sizes. More so, Engleman (1994) plotted the long-term growth trends of global industrial emissions of carbon dioxide and population, and found that since 1970 both emissions and population have grown at similar rates.

Inmaculada Aurelia & Rafael (2006) analyses the impact of population growth on CO₂ emissions in European Union countries from 1975- 1999. They concluded that the impact of population growth on emissions is more than proportional for recent accession countries whereas for old EU members, the elasticity is lower than unity and non significant when the properties of the time series and the dynamics are correctly specified. Likewise, Gregory & Galor (2016) in their study concluded that that 1% slower population growth could be accompanied by an increase in income per capita of nearly 7% while still lowering carbon emissions.

In addition, Martinez-Zarzoso (2008) studied countries of different income groups during the period of 1975-2003 and found that the impact of population growth on emissions is slightly different for upper, middle, and low income countries and that urbanization had a very different impact on emissions for low and lower-middle-income countries and upper-middle income countries. Behera and Vishnu (2011) showed that urbanization, population, service sector, industrial sector and GDP per capita had negative effects on environment.

Recently, Sanglimsuwan (2012) estimated the impact of changes in population, GDP and the structure of economy on carbon dioxide emissions for 83 countries from 1980 to 2007. The study suggested that higher population and higher percentage of working-age population lead to higher CO₂ emissions. Hamilton and Turton (2002) concluded that income per capita and population growth are the main two factors increasing carbon emissions in OECD countries, whereas the decrease in energy intensity is the main factor reducing them.

Bruvoll & Medin (2003) covered ten pollutants and find out that in all cases technique effects were dominant in offsetting the increase in scale. They concluded that whereas structural change explains the increase in energy intensity during 1913-70, technical change is the main factor reducing energy intensity after 1970. Shifts in the fuel mix are the main factor explaining carbon emissions per unit of energy used. Stern (2002) used an econometric model to decompose sulphur emissions in 64 countries during the period 1973-1990 and find out that the contribution of input and output effects to changes in global emissions is very modest, whereas technological change considerably reduces the increase in emissions.

However, the existing literatures focused on selected group of countries in which a panel data was adopted, so it will be unfair to generalize their outcome to the context of Nigeria. More so, some of these studies tries to link CO₂ emission to growth and also

adopted a splited data that laspse each other as obtained in the works of Chinda & Abdulrahim (2018), but this study is unique because it is country specific which necessitate the adoption of a time series data and it further covers an extended period without splitting and overlapping the period when compared to existing literatures.

METHODOLOGY

The study employed quantitative method. Time series data was adopted from 1975-2016. The variables of the models was drawn from the works of Dietz & Rosa (1997), which was earlier formulated by Ehrlich (1968) and Holder & Ehrlich (1974) in the form of an equation called IPAT equation.

$$I = PAT \dots\dots\dots(1)$$

More so, a modified or stochastic model of the IPAT equation was adopted for the study which is called STRIPAT (Stochastic Impact by Regression on Population, Affluence and Technology). However, this model was re-modified and re-written as below to fit into the Ordinary Least Square (OLS) function.

$$I = \beta_0 + \beta_1POP + \beta_2AFF + \beta_3TEC + \mu_1 \dots\dots\dots(2)$$

where

- I = Amount of CO₂ Emissions. This involves Carbon dioxide emissions from industrial processes metric ton stemming from the burning of fossil fuels and the manufacture of cement. It expressed in kilo tons (Kt)
- POP = Population size- Total number of Population. This is expressed in numbers (millions)
- AFF = Affluence- is proxied by real GDP per capita in constant price (U.S dollar).
- TEC = Technology-This refers to CO₂ per unit of technology. It was obtained by dividing the CO₂ by the real GDP (US dollar).

In addition, the data was analyzed using descriptive statistics and other econometric tools like multiple regression.

RESULTS AND DISCUSSION

Result

Table 1 presents summary statistics about the variables used in the econometric analysis for Nigeria.

Table 1. Summary statistics

	CO2	POP	AFF	TEC
Mean	69.09524	114.5000	866.4524	34.56762
Median	70.00000	109.5000	486.0000	35.15000
Maximum	106.0000	186.0000	3222.000	52.90000
Minimum	35.00000	63.00000	154.0000	17.65000
Std. Dev.	23.06915	35.98865	871.0673	11.36724

From the Table 1, it was observed that the maximum value for carbon dioxide (CO₂) in 2016 reached to (106.00) from (35.00) with a standard deviation of (23.06). This depicts a high growth level of carbon dioxide (CO₂) emission in Nigeria despite its low level of technology. The statistics show that the median for population (POP) and Technology (TEC) is less than the mean, which indicates that the values are positively

skewed where as the median of CO₂ and TEC, is greater than their mean values, which reveals that their values are negatively skewed.

The regression result (Table 2) shows that there is a strong relationship between the regressand and the regressors with about 99 percent of coefficient of determination. This indicates that 99% variation in carbon dioxide (CO₂) is explained by the model during the period under review. The remaining 1% could be explained by other variables not included in the model.

Table 2. Regression result

CO ₂	=	-1.71791	+	0.01370*POP	-	0.00005.89*AFF	+	2.004*TEC
Se(β _i)	=	(0.1957)		(0.0019)		(-0.00008)		(0.005)
t(β _i)	=	(-8.77)		(6.887)		(-0.731)		(391.70)
Prob.(β _i)	=	(0.000)		(0.000)		(0.4690)		(0.000)
R ² = 0.99		R̄ ² (Adjusted) = 0.99		F-Ratio= 92170.65		DW=2.0		

The regression coefficient of population (POP) appeared with the correct sign; this is in line with our *a priori* expectation that population (POP) is positively related to carbon dioxide (CO₂) emission. For every one percent increase in population (POP) will lead to an increase of 0.01370 percent in carbon dioxide (CO₂) emission. This coefficient has a t-value of 6.887 which is supported by a p-value (0.0000) less than 0.05. Therefore, population (POP) is statistically significant in explaining variation in carbon dioxide (CO₂) emission. Affluence (AFF) has a negative relationship with population (POP) because the regression coefficient appeared with a negative sign (-0.00005). This means that for 1\$ increase in the level of affluence will result to 0.00005 reductions in CO₂ emission. Although, the variable is not statistically significant as depicted with a t-value of 0.731 (i.e., which is less than 1.96) supported by a p-value (0.4690) greater than 0.05.

The regression coefficient of technology (TEC) has a positive sign of (2.004) which implies that a unit increase in TEC will lead to 2.004 increases in CO₂. The coefficient of TEC has a t-ratio of 391.70 which implies that it is statistically significant, supported by a p-value of (0.0000) which is less than 0.05. However, F-ratio is 92,170.5 which is highly significant and implies that the model is adequate in explaining variation in RGDP under the period under review which is further confirmed by p-value < 0.05. The Durbin Watson statistic is 2.0 which depict the absence of serial correlation (Autocorrelation). This decision is buttressed by a rule of thumb which state, DW test statistic values in the range of 1.5 to 2.5 are relatively normal. But values outside this range could be cause for concern. Field (2019) suggests that values under 1 or more than 3 are a definite cause for concern.

Discussions

Firstly, there exists a positive relationship between CO₂ emission and population growth. Although, the impact of increased population is less proportionate to CO₂ emission. The marginal CO₂ emission recorded could be as a result of the gradual emergence of urbanization resulting from human activities. These human activities could be bush burning, ranching, deforestation, rise in number of cars, increased used in generator set due to epileptic power supply etc. but on the other hand, this CO₂ emitted is not proportionate to the population increased because majority of the active

population in Nigeria are unemployed which is estimated to be over 21 million and as such they do not engage in productive economic activities which could be in one way or the other create CO₂ emission. Consequently, this outcome confirms with the works of Hamilton & Turton (2002), concluded that income per capita and population growth are the main two factors increasing carbon emissions in OECD countries and also the works of Cole & Neumayer (2004) which they found a positive link between CO₂ emissions and a set of explanatory variables including population, urbanization rate, Impact-Population Affluence-Technology, energy intensity and smaller household sizes.

Secondly, there exist a positive relationship between CO₂ emission and technology. This is owing to the fact that existing technology been used in the country are not climate friendly. Taking in cognizance, the level of the country level of industrialization, it encourages waste directly via emission or indirectly by altering the consumption pattern and boosting the demand for manufactured goods which invariably means creation of by products which may be detrimental to the environment. For instance, in the oil and gas sector, there are high cases of gas flaring which is due to exploration/refining of crude oil by the oil companies and couple with the crude method of agricultural activities. This could lead to increased CO₂ emission and which will invariably affects the environment. More so, this outcome further corroborates with the works of Cole & Neumayer (2004) as stated earlier.

Lastly, the coefficient for affluence revealed that there is a negative relationship between CO₂ emission and affluence. This is in line with economic theory most especially the works of Kuznet popularly known as the "Environmental Kuznets Curve where CO₂ emission initially worsen but ultimately improve with income. In other words there exist an inverse-U shape relationship between affluence and CO₂ emission. Furthermore, this outcome could be to the fact that as the income of the Nigeria populace gradually increases, they gradually avoid the native or traditional way of their lifestyle which is considered as a factor for higher CO₂ emission and adopt a modern ways of doing thing which will certainly minimize CO₂ emission. For instance, Nigerians are gradually adopting the solar energy and cooking gas etc as alternative to power supply and cooking against the use of generator set and use of fire wood.

CONCLUSION AND RECOMMENDATIONS

Conclusion

Carbon dioxide is a creation of respiration and the burning of organic materials and it is continuously being recycled which is performed by human activities and if the human occupying such location are growing rapidly there exist the propensity of an increased in carbon dioxide emission. In the case of Nigeria it revealed that there exist a positive association between CO₂ emission, population and technology and an inverse relationship exist between CO₂ and affluence. The study therefore concluded that despite the fact that Nigeria been ranked seventh among the world populated countries; its CO₂ emission is still less proportionate to its population growth if juxtaposed with other nations like China, India and USA. However, the level of technological advancement and the changing living conditions of Nigerians having less "native" cooking fires against more air conditioning demands has a played critical role

Policy recommendations

Since there exists a causal relationship between CO₂ emission and technology, there is need for the Nigeria Government to adopt a Climate friendly technology that

will minimize the increasing CO₂ emission most especially in the areas of agriculture, manufacturing and oil/gas.

There is also need to improve the nations' GDP and also to control her population growth. This will invariably improve the per capita income of its citizenry and there is also need enact laws or amend existing laws on environment which will regulate the operations of not just human activities but also the activities of industries that emit CO₂.

More so, the unemployment rate needs to be minimized so that the active unemployed individuals can be engaged in productive activities. This could add up to GDP growth and further boost his/her income status which will lead to adopting technologies that are climate friendly as part of his/her lifestyle. Invariably, this will go a long way in minimizing the level of CO₂ emission in the country.

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Determinant of acquisition of financial institution

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Abstract

This study is aimed to investigate the determinants of finance companies' acquisition. During the last 15 years, there were more than 30 mergers and acquisition deals happened in the finance company industry. We have analyzed six micro financial ratios which are productivity ratio, profitability ratio, equity capitalization, leverage ratio, asset composition ratio, and firm size. The dependent variables are dummy variables of acquisition. The financial ratios are OER (operating efficiency ratio), ROE (return on equity), leverage, asset allocation ratio, equity size and firm size. The samples are the 90 finance companies who issued financial report from 2001-2015. Data were analyzed using panel data regression. The results of the study found that only company size had a significant effect on finance companies acquisition.

Keywords: *Acquisition, Finance, Merger*

JEL classification: G23, G34

INTRODUCTION

Every company that wants to grow bigger has two choices: grow in organic or in non-organic. Growing organically is the way that most companies do. Growing in a non-organic way is by forging alliance with other companies.

Building alliances with other companies can be through mergers and acquisitions, joint venture, strategic partnership/alliance, and franchise cooperation. Some companies choose mergers and acquisition options. The merger and acquisition strategy are some of the growth strategies, chosen by many companies to grow faster.

Many mergers and acquisitions transactions have taken place in the Indonesian financial industry over the last 15 years. Merger and acquisition transaction take place in the banking industries as well as the non-banking. Non-banking occurs in the finance industry, insurance and as well as security industries.

Merger and acquisition transactions will also affect the economic growth of a country. Xu (2017) found that prohibiting the merger and acquisition (M&A) would lead to the reduction of the aggregate growth rate of US economy by 0.1% and the reduction of the aggregate TFP by 5%.

Most of the merger and acquisition transactions in financial industry are conducted by companies that have specific relationship. The relationship deliberated here is that the holding company acquires the finance company for their supply chains. Banks and automotive companies acquire finance companies as their supply chain. Both industries are related to the financing industry.

Although there are numerous researches concerning the determinant of merger and acquisition, especially financial industry, there is no conclusive result yet, such as

Ashmore (2004), Hyun & Kim (2007), Wu & Xie (2010), Erel, Liao, & Weisbach (2011), Nguyen, Yung, & Sun Nguyen (2012), Tanriverdi & Uysal (2015), Holburn & Bergh (2014), Offenbergl & Pirinsky (2015), Henrich & Zhang (2017). Therefore, it is important to conduct a research on this topic, especially in a specific industry such as consumer finance industry.

Ashmore (2004) found that profitability, capitalization, intangible assets, quality of credit were the determinants of mergers and acquisitions. The research was conducted in 1994-2003 in the United States.

Hyun & Kim (2007) suggested that legal and institutional quality and financial market development increased M&A volume across countries. The significant effect of institutions however, might disappear for transactions between countries of the similar stage of the development. Correa (2009) found that the small size of assets, the diversified portfolio, the size of assets, the size of revenue and capabilities were the determinant factors in the acquisition. Wu & Xie (2010) showed that pre-acquisition performance and proportion of the state shares had a positive impact on performance of acquiring companies.

Erel, Liao, & Weisbach (2011) showed that geography, the quality of accounting disclosure, and bilateral trade increased the likelihood of mergers between two countries. Therefore, valuation appeared to play a role in motivating mergers; firms in countries whose stock market had increased in value, whose currency had recently appreciated, and who had relatively high markets to book value tend to be purchasers, and firms from weaker-performing economies tend to be targets.

Nguyen, Yung, & Sun Nguyen (2012) used a recently developed technique to examine post-acquisition evidence as to the motives behind merger and acquisition activity. Using a sample of 3,520 domestic acquisitions in the United States, we found that 73% of those were related to market timing; 59% were related to agency motives and/or hubris; and 3% were responses to industry and economic shocks. Our results also showed that about 80% of the mergers in our sample involved multiple motives. Thus, in general, it is very difficult to have a clear picture of merger motivation because value-increasing and value-decreasing motives may coexist.

Johan (2012) researched on the determinant of financial services industry acquisition determinant in Indonesia from 2000 – 2011. It was found that the determinants of finance companies targeted for all types of takeover were the size of the assets and profitability ratios. The larger the asset size was, the more attractive the companies would be for acquisition; while companies with low profitability would be more attractive for acquisition. The sample of the research was 100 finance companies in Indonesia.

Becalli & Frantz (2013) investigated the determinants associated with the likelihood of a bank becoming involved in a merger or an acquisition. They investigated the determinants of being a target or an acquirer from a sample of 777 deals involving EU acquirers and 312 global targets over the period of 1991 to 2006. The results found that banks were more likely to be targets if they have lower free cash flows, are less efficient, are relatively illiquid, and are under-capitalized.

Tanriverdi & Uysal (2015) indicated that information technology merger and acquisition integration did not always lead to greater value creation in M&A. The study makes a contribution by identifying the contingencies under which IT M&A integration creates wealth for acquirer's shareholders.

Holburn & Bergh (2014) investigated empirically whether and how firms use election campaign contributions to politicians as a method of influencing regulatory merger approvals. They found that utilities increased their contributions in the year before

they announced a merger and that merging utilities increased their contributions more in states with greater political party competition. Their findings contributed to political strategy research by providing novel evidence that firms integrate market and nonmarket strategies.

Jayaraman, Srinivasan, & Arunachalam (2014) observed that technical efficiency of merged banks deteriorated immediately after the merger and showed improvement from the third year of post-merger period. Hence, the effect of merger and acquisition on the profitability and operational cost of merged banks, in general, is not significant during the initial phase of merger, i.e. initial three years.

Offenberg & Pirinsky (2015) showed that deals in more competitive environments and deals with lesser external impediments on execution are more likely to be structured as tender offers. Furthermore, the rivals of the bidding firm exhibit significantly lower announcement returns in tender offers than in mergers.

Table 1. Previous research summary

Variable	Researched By	Related to Acquisition
Pre-acquisition Performance	Wu & Xie (2010)	Significant /Positive
Profitability	Ashmore (2004) Johan (2012)	Significant
Efficiency	Jayaraman, Srinivasan, & Arunachalam (2014) Becalli & Frantz (2013)	Significant
Legal Quality	Hyun & Kim (2007)	Significant/Positive
Financial Market Quality	Hyun & Kim (2007)	Significant /Positive
Market Timing	Nguyen, Yung, & Sun Nguyen (2012)	Not Significant
Agency Motives	Nguyen, Yung, & Sun Nguyen (2012)	Not Significant
Higher Growth	Becalli & Frantz (2013)	Significant
Equity Size	Becalli & Frantz (2013)	Significant
Firm Size	Correa (2009), Johan (2012)	Significant
Leverage	Jandik, T., Lallemand, J., (2017).	Significant
Asset Allocation	Correa (2009)	Significant

Jandik & Lallemand (2017) found that bank debt is the primary source of these debt increases. Lastly, we find evidence consistent with the expectation of improved bargaining power for target equity holders with target debt issuances. We document that compared to debt issued by non-target firms, announcements of debt issuances by takeover targets are associated with additional positive abnormal returns to target stockholders. Debt issuances occurring after takeover announcement appear to reverse lower (higher) abnormal returns experienced by targets (bidders) upon takeover announcement itself.

Henrich & Zhang (2017) analyzed how the old state socialism logic and the new market capitalism logic competed to influence Chinese firms' mergers and acquisitions. They found that these institutional logics affected M&A decisions via the coalitions committed to each logic—coalitions whose balance of power reflected the external power source of ownership and the internal power source of board representation. They also found that each coalition's strength changed as the market capitalism logic became more established during China's economic transition, and that investors viewed M&A by firms with high state ownership skeptically.

This paper will study the determinant of acquisition of consumer finance company industries in Indonesia during 2001-2015. The performance measurement will be based on the financial performance: OER (operating efficiency ratio), ROE (return on equity), equity capitalization, leverage ratio, asset allocation, and firm size.

The rest of the paper will be organized as follows, after the introduction; we describe the data and methodology in Section 2, followed by the result and discussion in Section 3. Finally, Section 4 will be giving summary and conclusion remarks.

METHOD

Data

This research uses secondary data which was collected from various official publications by the institutions. The data are panel data consisted of cross section and time series data from 2001-2015.

The sample is the finance company who issued their official financial statement during the research period. The sample consisted of 90 finance companies. All finance companies are registered under the Financial Service Authority/*Otoritas Jasa Keuangan* (OJK).

Research model

To analyze the determinants of acquisition of finance company industries, the panel data regression model is used with the following equation:

$$Y_{it} = a + b_1BOPO_{it} + b_2ROE_{it} + b_3Equ_{it} + b_4Lev_{it} + b_5PATA_{it} + b_6FSI_{it} + \varepsilon$$

Y_{it} = Dummy of acquisition

OER = Operating efficiency ratio

ROE = Return on equity

Equ = Equity capitalization

Lev = Leverage ratio

PATA = Asset allocation

FSi = Firm size

There are three models in panel data regression, namely PLS, FEM and REM models. For the selection of the best model, the Chow test and Hausman test are used. Furthermore, the variables and measurements are given in Table 2

Table 2. Variables measurements

Variables	Codes	Measurements
Return On Equity	ROE	Net income/total equity
Leverage	LEV	Total debt/total equity
Asset allocation	PATA	Productive asset/total asset
Operating efficiency ratio	OER	Expense/revenue
Firm Size	FSi	ln (Total Asset)
Equity Capitalization	Equ	ln (Total Equity)

Hypothesis

There are six hypotheses proposed in this study. Based on the previous research, the hypotheses are as Table 3.

Table 3. Research hypotheses

Hypotheses	Variables	Expected relationship
H1	Operating efficiency ratio	Significant
H2	Asset Allocation	Significant
H3	Return On Equity	Significant
H4	Leverage Ratio	Significant
H5	Equity Capitalization	Significant
H6	Firm Size	Significant

RESULTS AND DISCUSSIONS

Based on the research data, it showed that the median of operating costs to operating revenues reached 152%. The results showed over than 100%, it means the cost is exceeding the revenues. On the return on equity, there are 1 company that reached 29.84%, however there was a company achieve -61,07% on the return on equity.

Table 4. Statistic descriptive

Variables	N	Minimum	Maximum	Median	Standard Deviation
OER	1,350	-46.71	31,666.67	152.70	1,070.12
ROE	1,350	-61.07	29.84	0.11	2.03
Equ	1,350	494,909.00	87,927,596.00	786,274.73	5,787,874.80
LEV	1,350	0.00	747.66	1.28	20.37
PATA	1,350	0.00	913.58	75.16	41.52
FSi	1,350	0.00	574,911,647.00	33,304,637.56	4,004,731.40

Few finance companies that have zero debt, which is shown in the leverage ratio at 0%. The biggest company booked an asset at IDR 574 Billion; however there was a company with the assets that reached 0. Furthermore, the estimated result of panel data regression model consist of PLS, FEM, and REM, given in Table 5.

Table 5. Panel data regression model result

Variables	PLS	FEM	REM
OER	0.00000 (0.0000)	0.00000 (0.0000)	0.00000 (0.0000)
ROE	0.00605 (-0.0064)	-0.00029 (-0.0019)	-0.00023 (-0.0019)
Equ	-0.02750 *** (-0.0078)	-0.00051 (-0.0026)	-0.00083 (-0.0026)
LEV	0.00050 (-0.0006)	0.00012 (-0.0002)	0.00013 (-0.0002)
PATA	-0.00037 (-0.0003)	-0.00014 (-0.00010)	-0.00014 (-0.0001)
FSi	0.11736 *** (-0.0147)	0.01106 *** (-0.0055)	0.01252 *** (-0.0055)

Numbers in () states the estimated standard error

****) Significant at the real level of 1%*

Based on Chow test, PLS model is better than FEM model (with probability of F and Chi-square < 0.01). Furthermore, based on Hausman test shows that FEM model is better than REM (with probability of Chi-square < 0.01). Therefore, it can be concluded that FEM is the best model.

Testing H1 (Efficiency)

The test results show that efficiency ratio is not the significant variable which determinant an acquisition. If the OER is more than 100%, normally, the finance company will be the target of acquisition. In general, the target company is a company that has bad OER. Hence, the efficiency ratio is not a major factor in the determination of the acquisition. The efficiency ratio results is supported by the research of Jayaraman, Srinivasan, & Arunachalam (2014), however it is differed from the results of Johan (2012).

Testing H2 (Asset allocation)

According to the pooled least square, the asset allocation (PATA) variable does not show a significant influence on the decision of the finance companies' acquisition. In general, targeted finance companies tend to have productive assets but poor-quality assets. Poor quality indicates many assets are overdue and write off. Hence, the asset allocation composition is not a major factor in the determination of the acquisition. The results was opposite with the results of Correa (2009).

Testing H3 (Profitability)

No significant results were found for return on equity variable. In general, targeted finance companies have low profitability positions. Low profitability will result in low ROE. Therefore, profitability is not the main thing in determining the acquisitions. The results are linked with the results by Jayaraman, Srinivasan, & Arunachalam (2014) and Johan (2012).

Testing H4 (Capital structure)

Leverage variable does not show any significant influence on the acquisition decision of finance company. The results are connected with the results by Johan (2012). In general, targeted finance companies have high leverage. High leverage ratios result in financial distress. Normally, a company needs an acquisition to assist it out from financial distress. Therefore, the leverage ratio is not determined the acquisition strategy.

Testing H5 (Equity capitalization)

Equity capitalization variable does not show any significant influence on the acquisition decision. The acquired companies usually have low profitability and also low returns. There are companies that have lost money. Hence, the value of equity is not a major factor in determining the acquisition strategy. Acquirer looks for small size of investment. Hence, the acquirer will look for small size of equity capitalization. It is line with the results of Becalli and Frantz (2013).

Testing H6 (Firm size)

Based on Hausman and Chow test with significant at $\alpha < 1\%$ showed in table 6, the fixed effect model test is chosen for the test. Company's size variables show significant influences on the acquisition decision of finance company, with a significance level $\alpha < 1\%$. The results are in line with the results of Correa (2009) and Johan (2012). Almost all investors will look for finance companies that have a meaningful size. Investors want to get results fast. Hence, size becomes a significant factor in the acquisition's decision. The results is also supported by the term of financial company "too big too fall".

CONCLUSION AND RECOMMENDATIONS

Conclusions

The determinant of acquisition of consumer finance company is the company size. It is in line with the investors want in general. If the target company is too small, the investor will tend to establish a new company rather than acquire a company. Hence, the firm size has a significant influence in the acquisition decision. Other variables such as equity capitalization, profitability ratio, efficiency ratio, and asset allocation do not have a significant influence in the acquisition decision.

Normally companies who are under performed in profitability and efficiency, smaller in equity size and lower asset allocation, are targeted for sale by the shareholders. Therefore, the other ratios are not significant. The research only focused on the consumer finance company, however the other researches are focused on banking industry. Even

though, the industries are financial services, however there are potentially different characteristic between banking and financial service. The further research, should include all financial industries such banking, insurance, securities house and consumer finance.

Recommendations

The management of finance company should be able to grow the company size, if they want to be the target of acquisition. Size is the important factor for a financial institution. Further research can be conducted to identify other internal factors and external factors that have an impact on acquisition. Other internal factors are management influence, payment method on acquisition, and controlling shareholders background. The external factors are economics growth, population of a country, and gross domestic product.

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Analysis of village fund management in poverty alleviation at Pasaman Regency, West Sumatra

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Abstract

This research examines the effect of village fund management toward poverty alleviation in Pasaman Regency, West Sumatra. The data of the research were obtained from the Social Service and Regional Government of Pasaman Regency in 2016-2018. The sample of this research is 37 villages at Pasaman Regency in 12 sub-districts. The research was conducted using the panel data regression method. The results showed that each policy area of village fund use in Pasaman Regency was able to reduce poverty simultaneously. Partially from the four research variables, it was found that community development and infrastructure development policies were able to influence the reduction of poverty in Pasaman Regency.

Keywords: Village fund, Poverty, Rural development

JEL classification: H53, O18, R51

INTRODUCTION

To realize the national ideals concerning sustainable development, the Government as a stakeholder of the Indonesian people must be able to determine several of concrete steps and appropriate policies that can shove Indonesia's economic development towards a more positive direction. One form realization of the national ideals' sustainable development is contained in a policy established by the Indonesian government, by issuance the Republic of Indonesia's Law Number 32 Year 2004 about Regional Autonomy. Regional autonomy is the right, authority, and obligation of autonomous regions to regulate and manage their own government affairs and the interests of the local community in accordance with government affairs, and the interests of the local community in accordance with laws and regulations (Law Number 32 Year 2004 Article 1 Number 5).

Regional autonomy was born with the aim that each region is able to provide targeted policies to improve community welfare, one form of welfare standards that should be achieved by regional autonomy is reducing poverty. Regional autonomy is the distribution of authority focusing on district/city regional governments, as regulated in the regional government law to realize a good governance in budget management, but essentially it must be understood that independence must begin at the most bottom level of government that is the village, so that regional development should be directed towards empowering rural communities through the village government.

In accordance with *Jokowi's Nawacita* which is to build Indonesia from the periphery by strengthening villages and regions within the framework of a unitary state, village development is realized by the issuance of Law Number 6 Year 2014 which states that 10% of funds are budgeted from the State Budget (*APBN*) and Regional

Government Budget (*APBD*) for each village. Distribution of village funds began in 2015, becoming an opportunity for the village to become autonomous and independent because with village funds received, the village could become independent and be able to manage its own finances in order to develop the village.

West Sumatra based on data from the Indonesian Central Bureau of Statistics is a province with a total of 928 villages, a village government for the West Sumatra is called nagari has also provided meaningful changes in life order of the people of West Sumatra, based on the past history, Minangkabau people have used to know the Village Government, in this case, the nagari government, so that with the existence of regional autonomy the people of West Sumatra tend to be better prepared because they re-run the system of government that was once implemented. Since the launch of the Village Fund policy in 2015, West Sumatra has slowly but steadily succeeded in reducing poverty with an average decline by 0.22%.

At the regency level, Pasaman Regency is one of 19 regencies/cities in West Sumatra Province, consisting of 12 districts and 37 *Nagari* that has felt the impact of decentralization from the perspective of poverty reduction, based on data released by the West Sumatra Central Bureau of Statistics, Pasaman Regency since 2015 which is also the first year of village fund policy implementation until 2018, it has been recorded that it can reduce poverty by 1.62%

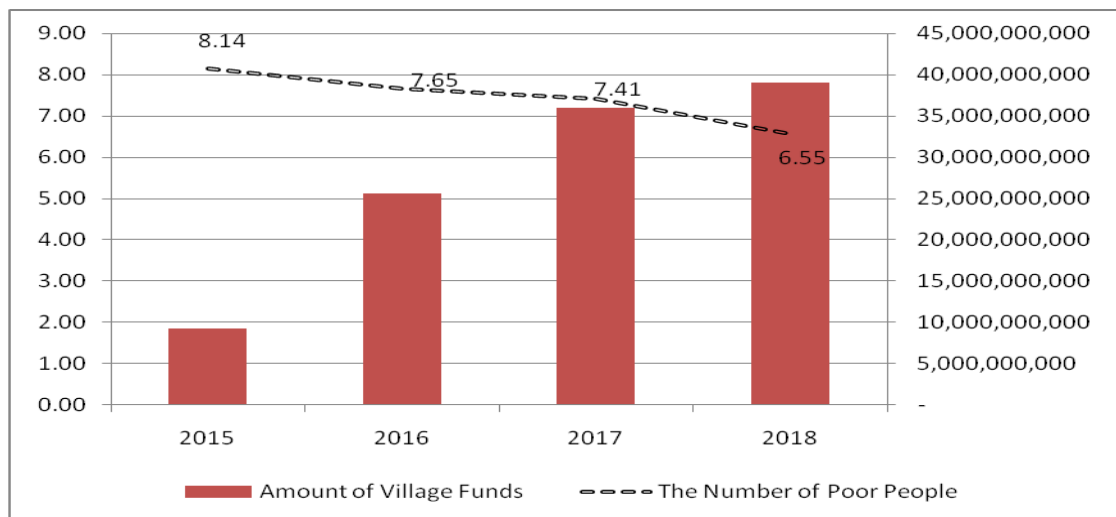


Figure 1. Poor population receipt of village funds in Pasaman Regency in 2015-2018
 Source: *Pasaman Regency Central Bureau of Statistics, 2018*

Pasaman Regency Central Bureau of Statistics found that an increase in the number of village funds received by Pasaman Regency was followed by a reduction in the percentage of poor people in Pasaman Regency. From 2015 to 2018, there was an increase in receipt of village funds by 30 billion rupiah, this significant increase in the number of receipts was able to have a positive effect on poverty alleviation in Pasaman Regency. Pasaman Regency Central Bureau of Statistics determined that Pasaman had succeeded in reducing the number of poverty by 1.59%, which was in 2015 amounted to 8.14%, reduced to 6.55% in 2018.

Susilowati & Syamsul (2017) mentioned one of the goals of the Village Fund is as a tool to alleviate poverty and inequality. In its use, 30% of Village Funds are used for operational costs of administering village government and 70% are used for physical development and community empowerment. The existence of a village fund program is expected to have a positive impact not only in infrastructure development but also have a direct effect on reducing poverty rates. *Nagari* at Pasaman Regency, which is located

in West Sumatra Province, is one example of the existence of villages in Indonesia which received funding from the Village Fund program. With characteristics that almost represent the villages in general, village funds are expected to be able to have a real impact on the effectiveness of the use so that it is expected to reduce the poverty rate in Pasaman Regency.

This research aims to determine the extent of the success of the village fund program in Pasaman Regency and to find out how much influence from the village fund policy is able to have a positive effect in reducing poverty in Pasaman Regency, West Sumatra, because basically one of the objectives of the village fund is providing assistance for physical development and empowerment of village communities. With the existence of a village fund program, the target is achieved not only to accelerating the physical development process. It is expected that village human resources is able to carry out more effective and targeted production activities because in the village fund there is a goal of community development aimed at providing job training and work guidance for village communities and in the future it is expected that it will be able to increase individual income so that the poverty rates in the village will automatically decrease.

THEORETICAL REVIEW

Fiscal decentralization

Fiscal decentralization is a process of distributing the budget from a higher level of government to a lower government to support the functions or tasks of government and public services in accordance with the many authorities delegated to the government. According to Khusaini (2006), fiscal decentralization is a delegation of authority on the field of budget or financial receipts that were previously centralized, both administratively and in its use regulated or carried out by the central government.

Madiasmo (2009) argues that fiscal decentralization requires the distribution of authority to the regions in terms of revenue/funding (revenue assignment) that accompanies the assignment of tasks and authority to local governments (expenditure assignment) so that the central and regional financial relations need to be regulated in such a way. Thus, expenditure needs that are the responsibility of the region can be financed from existing revenue sources.

For a country like Indonesia whose geographical condition is a vast archipelago with diverse social and economic conditions. By providing greater financial management responsibilities, it is expected that resource mobilization will be better. Even fiscal decentralization should be able to increase economic growth and public welfare because sub-national governments/local governments will be more efficient in producing and providing public goods (Oates, 2006; Pujiati, 2006).

The implementation of fiscal decentralization in Indonesia began in 2001. Since the implementation of the fiscal decentralization system, there has been a general change of authority in managing expenditure and budget revenues. The regional government has broader authorization in managing its expenditure and revenue, therefore the fiscal decentralization system actually also increases regional authority to plan and control the Regional Government Budget (APBD). Thus, fiscal decentralization will increasingly provide benefits if there are financial capabilities of the autonomous region concerned. According to the Law Number 33 Year 2004 about Financial Balance Between the Central Government and Regional Governments, it states that the sources of regional government revenues in implementing fiscal decentralization are: District Own Source Revenue (PAD), General Allocation Funds (DAU), Specific Allocation Funds (DAK), Revenue Sharing Funds (DBH), regional

loans and other legal receipts. Fiscal decentralization should provide hopes and benefits such as improving public services, high economic growth, alleviating poor people, better macroeconomic management and good governance systems (Kumorotomo, 2008).

Village fund

Further derivatives of fiscal decentralization are village funds, the funds originating from the State Budget that are allocated to villages that are transferred through Regional Government Budget and are used to finance government administration, implementation of development, community development and community empowerment (Based on the Law Number 6 Year 2016 about villages). The purpose of the village fund itself is to accelerate the growth and development of the village in order to overcome the various problems that have existed, to develop the quality and welfare of the community because the quality village communities certainly become useful inputs both for the village itself and other regions and finally increase income distribution and equitable development.

Relationship of village funds to poverty

Village Funds sourced from the State Budget which are allocated to villages that are transferred through the Regional Government Budget are used to fund government administration, implementation of development, community development, and community empowerment. The higher the size of the Village Fund is expected to be able to reduce poverty and even distribution of income so that poverty and inequality will decrease (Susilowati, Dwi, & Syamsul, 2017). This also refers to the purpose of the issuance of Village Fund policies in the "Smart Book Village", are reducing poverty and inequality.

Handra (2016) was explained that the Village Fund greatly contributes to reducing the number of inequality in Indonesia with further effects when inequality has been reduced and will have a positive impact on reducing the number of poor people. Setianingsih (2016) also found a similar thing, village funds proved to be able to affect poverty reduction in Malawi District. The acceleration of infrastructure development will encourage effectiveness in production so that it will provide an internal impetus to increase income, this will certainly make families defined as poor families able to get out from the circle of poverty.

Besides having a direct influence on the development of infrastructure, village funds are also targeted at empowering and fostering rural communities which in practice the purpose of using village funds in this field is to encourage the improvement of the quality of human resources in the village itself. With the change in the quality structure of human resources in the village, it is expected that the ability of rural communities to produce will be more effective and effective so that it can produce further efficiency which will have an effect on increasing per capita income. Increased income can provide final conclusions, namely the achievement of village fund policy targets in terms of poverty alleviation.

Village funds are expected to be able to give a direct contribution to improving the quality of community life because the village funds are independently capable of empowering the community so that the quality of the existing human resources in the village increases. Furthermore, this will encourage the productivity of the village community because Modern economic theories that find the quality of human resources are the driving factor of productivity.

METHODS

This research uses data sourced from regional agencies in Pasaman Regency such as poverty data measured using the Family Registers (KK) of poor population in Pasaman that obtained from the Integrated Data Base (BDT) of Pasaman Social Services and village fund data for 2016-2018 obtained from the Regional Government of Pasaman Regency.

The sample in this research was 37 *nagari* in 12 districts in Pasaman Regency with the observation period for three years from 2016 to 2018. The model in this research was adopted from the research conducted by Setianingsih (2016). The research model was formed as follows:

$$Poverty_{it} = \beta X_{1it} + \beta X_{2it} + \beta X_{3it} + \beta X_{4it} + \epsilon$$

Where X1 is village funds used for community empowerment in Pasaman Regency, X2 is village funds used for Community Development, X3 is a variable of village funds used for village development and finally X4 is village funds for the administration of village government, representing errors model calculations in components X1, X2, X3, and X4.

To find out how each policy from the use of village funds is able to influence poverty in the villages in Pasaman Regency, the panel data regression method was used in this research.

RESULTS AND DISCUSSION

Poor households in Pasaman Regency, West Sumatra

In 2018, there were 34,167 poor people in Pasaman Regency. Compared to the number in 2016 which was 38,849 households, there had been a decrease of 6.03 per year. However, out of 12 sub-districts, only four sub-districts experienced a decline, with the highest decline in Padanggelugur sub-district by 31.56 percent per year. Eight sub-districts experienced an increase in poor households' number with the largest increase in Panti sub-district by 4.34 percent per year (Table 1).

A similar condition is also seen at the level of *nagari*. Of the 37 *nagari*, only 11 *nagari* experienced a decrease in poor households' number, with the highest decline in *Nagari* Bahagia by 44.19 percent per year. Conversely, 26 other *nagari* per experienced an increase in the number of poor households with the largest increase in *Nagari* Panti by 27.05 percent per year (see appendix 1).

Table 1. Poor households in Pasaman Regency, West Sumatra, 2016 - 2018

No.	Sub-districts	No. of villages	Year			Growth per year (%)
			2016	2017	2018	
1	Bonjol	4	3,271	3,303	3,304	0.50
2	Tigo Nagari	3	2,973	3,086	3,046	1.23
3	Simpang Alahan Mati	2	1,589	1,610	1,638	1.54
4	Lubuk Sikaping	6	3,510	3,734	3,730	3.13
5	Duo Koto	2	5,550	5,583	5,554	0.04
6	Panti	3	3,778	4,249	4,106	4.34
7	Padang Gelugur	4	8,409	3,090	3,101	-31.56
8	Rao	2	2,143	2,213	2,224	1.89
9	Mapat Tunggul	3	1,708	1,741	1,599	-3.19
10	Mapat Tunggul Selatan	2	1,625	1,643	1,609	-0.49
11	Rao Selatan	3	2,485	2,558	2,486	0.02
12	Rao Utara	3	1,808	1,822	1,770	-1.05
Total		37	38,849	34,632	34,167	-6.03

Source: Integrated Data Base (BDT) of Pasaman Social Services

Village funds in Pasaman Regency, West Sumatra

The average village funds that had been channeled in Pasaman Regency, West Sumatra in 2018 were Rp 1.975 million per village. It had been increased by Rp 229 million if it is compared to the number of village funds in 2016 that was IDR 1.747 million (Table 2).

Table 2. Village Funds in Pasaman Regency, West Sumatra, 2016 – 2018 (IDR Million)

Allocation	2016		2017		2018	
	IDR	%	IDR	%	IDR	%
Village development	1456	83.34	1603	78.72	1490	75.45
Rural community empowerment	207	11.85	264	12.98	323	16.37
Fostering of the rural community	40	2.31	121	5.94	117	5.92
Government administration	44	2.50	48	2.36	45	2.26
Total	1747	100.00	2037	100.00	1975	100.00

Source: Regional Government of Pasaman Regency.

Increasing the receipt of Village Funds which increases every year is expected to reach the level of welfare of the community every year. This certainly needs to be followed by improving the quality of users who use the aid funds so that the realization targets are expected to be achieved.

In achieving the government's development goals, to build Indonesia from the periphery and realize the regional autonomy policy, village funds are one of Indonesia's sustainable development solutions that focus on the country's development from the lowest level, namely the village. In practice the village fund program itself has been running for 5 years from 2015 to the present, high expectation for the success of the program is certainly the responsibility of the village funds user that transferred from the center to the regions.

The village funds are allocated for the use of village development, rural community empowerment, fostering of the rural community, and government administration. In 2018, by average, allocation of village development was IDR 1.490 million (75.45 percent), allocation of rural community empowerment was IDR 323 million (16.37 percent), funds for fostering of rural community was IDR 117 million (5.92 percent), and funds for village development was IDR 45 million (2.26 percent). Compared to the condition in 2016, there was a decline in allocation for village development and government administration, but an increase in funds for empowering the rural community and fostering rural community.

In the field of village development, the realization of the use of village funds intended for development has the highest proportion in terms of budget use. It is expected that village development will be faster so that the level of welfare of the village community will increase and further it is expected to provide encouragement or motivation to be more productive in the future.

In terms of empowering rural communities, village funds transferred from the central government to village governments obtain a smaller proportion compared to the rural development sector. This is explained because the main focus of the use of village funds is for the development of the village then to develop the quality of human resources. The use of village funds in the field of community empowerment is expected to encourage the improvement of the quality of rural community human resources through training so that the village community is more effective and efficient in producing.

The realization of the use of village funds for the development of rural communities in Pasaman Regency from 2016 to 2018 has proceeded as it should. Even though the budget spent is not as big as other fields, the value is expected to be able to provide a positive effect in terms of fostering rural communities to be more effective in producing in the future.

Influence of village funds management on poverty alleviation in Pasaman Regency

The first step in selecting a panel data regression model is to regress panel data using Pooled Least Squared (PLS), Fixed Effect (FEM) and Random Effect (REM) models as shown in Table 3

Table 3. Estimated Result of PLS, FEM and REM

Research Variable	PLS	FEM	REM
Implementation of Village Government Sector	0.338906	0.015512	0.086731
Development of Village Government Sector	0.045880	- 0.062674*	-0.058677
Village Community Empowerment Sector	-0.013313	- 0.163220	-0.115715
Village Community Development Sector	0.525045**	- 0.232499*	0.016109
C	-11.185717	1.559.188	7.901.634
R-squared	0.133917	0.886027	0.035629
F-statistic	4.097.538	1.360.448	0.979039
Prob(F-statistic)	0.003972	0.000000	0.422274

Significant at level * = 5%, ** = 1% (see the output details in appendix 2 - 4)

Pooled Least Square is the easiest way to regression the combination of cross-section data and time series data. It is the simplest panel data model approach because it only combines time series data and cross section. In this model, the time and individual dimensions are not considered, so it is assumed that the data behavior is the same in various time periods. This method can use the Ordinary Least Square (OLS) approach or the least squares technique to estimate the panel data model.

Fixed Effect Model is a regression that includes dummy elements into the panel data model. Fixed Effect Model is generally used when N is relatively smaller and T is relatively larger. FEM estimates that there is an omitted bias variable that allows influencing the intercept time series or cross-section. This model assumes that differences between individuals can be accommodated from the difference in intercepts. To estimate the Fixed Effects panel data using a variable dummy technique to capture the difference in intercepts between cross-section data, intercept differences can occur due to differences in the internal conditions of the area concerned. However, the slop is the same between the cross-section regions. This estimation model is often also called the Least Squares Dummy Variable (LSDV) technique.

To choose the most appropriate model between the two models above, then the Likelihood Ratio test is carried out. The chow test is one of the tests used to determine the best model between Pooled Least Square and Fixed Effect Model. This test is done by comparing the F-count and F-statistic values. The F test is used to test all variables at once or multiple as the explanatory dependent variable. If $prob > F > \alpha 0.05$ then H_0 is accepted (not significant), meaning that the Pooled Least Square model is better than the Fixed Effect Model. If $Prob > F < \alpha 0.05$ then H_0 is rejected (significant), meaning that Fixed Effect Model is better than Pooled Least Square. The results of the Likelihood Ratio (Chow Test) test can be seen in Table 4.

Table 4. Test of likelihood ratio

Effects Test	Statistic	d.f.	Prob.
Cross-section F	12.831390	(36,70)	0.0000
Cross-section Chi-square	225.109857	36	0.0000

Based on the results of Likelihood Ratio test above which states that the model following the Pooled Least Squared was rejected, because of the Prob. Cross-section $F < 0.05$. Therefore the more appropriate model chosen is the Fixed Effect model.

Random Effect Model is a model that calculates errors from time series and cross sections in panel data analysis. Random Effect Model is generally used when N is relatively larger and T is relatively smaller. In general, the approach used to predict Random Effect Model is generalized least square (GLS). To choose the most appropriate model between Fixed Effect and Random Effect, a Hausman Test is performed. Table 5 is the result of the Hausman test.

Table 5. Hausman test

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	44.140306	4	0.0000

Hausman test is also one of the statistical tests to determine which is better between Fixed Effect Model and Random Effect Model to use. The way to determine the best model of the Hausman Test is to look at chi square (X^2). The suitability test of the panel data model between Fixed Effect Model and Random Effect Model using the Hausman test shows the p-value X^2 (prob.) Value $< \alpha 5\%$. If $\text{prob} > F > \alpha 0.05$ then H_0 is accepted (not significant), meaning that the Random Effect Model is better than the Fixed Effect Model. If $\text{Prob} > F < \alpha 0.05$ then H_0 is rejected (significant), meaning that Fixed Effect Model is better than Random Effect Model.

Based on the results of the Hausman test in Table 5 above, the most appropriate model to be used in this study is the Fixed Effect model, because of the Prob. Random cross-section > 0.05 .

After estimated using the panel data regression method and the selected model selection test, the Fixed Effect model was used as the best model that was able to explain how the influence of each village fund use policy on poverty alleviation efforts in Pasaman Regency.

Based on the results of the Fixed Effect model, it was found that every policy area in the use of village funds in Pasaman was able to provide a reduction in poverty in Pasaman Regency. The entire model explains the reduction in poverty in Pasaman Regency by 88,6%. If partially seen, community empowerment policies are able to influence the poverty rate in Pasaman Regency as evidenced by a small prob value of a significance level of 5%, the coefficient value of the variable community empowerment policy also shows a negative value of -0.036483 which means that every budget increase for community empowerment villages in Pasaman Regency will provide a reduction of poverty in Pasaman by 3.6%.

Good results that are in line with expectations are also found in the village fund policy in the village development community, which in this finding showed significant value for changes in the value of poverty in Pasaman Regency, this was evidenced by a small significance value of 5% significance level and regression coefficient. Negative value of -0.232499 means each increase in budget for infrastructure development in villages in Pasaman Regency by 1% is also able to reduce poverty in Pasaman Regency by 23.25%. Effective development will be able to provide an impetus for effectiveness and efficiency in the productivity of society and this is what is currently felt by the people of Pasaman Regency. The direction of development that is in accordance with the needs of the community is able to increase the impetus to obtain increased income which further will have an effect on poverty reduction.

There are differences in results found in this research if compared with previous one conducted by Setianingsih (2016). In Melawi Regency in 2016, Setianingsih found that infrastructure development had not been properly targeted for the use of village budget funds, so the results were found instead of reducing poverty but vice versa. The use of village funds for fostering village communities in Melawi Regency also has a less significant effect in reducing poverty in Melawi Regency, although the simultaneous model used by Setianingsih (2016) is said to be able to reduce poverty statistically, but partially if seen for each use of village funds in accordance with the policy of using the expected results that cannot yet be obtained. This result can be said to be reasonable because basically, the village fund policy is a policy that is only 1 year old when viewed at the time of the research conducted by Setianingsih (2016).

Village funds for the field of village administration were found to be insignificant in reducing poverty in Pasaman Regency in the study. This is because the use of the Village Fund in this field is more operational in nature and only for supporting activities, and the amount is also relatively very little of the percentage of Village Fund usage in each village.

The allocation of village funds used for community development in Pasaman Regency in this study was found to be significant and able to have an effect on poverty reduction. It can be concluded that the use of Village Funds for community development in Pasaman Regency is right on target. This is part of an effort to realize the vision of the Pasaman Regency Government.

Village funds for the field of community empowerment in this study were found to be insignificant in poverty in Pasaman Regency. For community development to be more empowered and independent, less attention is given by the average *nagari* government in Pasaman Regency. *Nagari* is more focused on this empowerment program through programs that are in the APBD or APBN which are technically implemented in the Regional Devices Organization.

The use of the Village Fund budgeted for infrastructure development in Pasaman District was found to be significant and able to influence poverty reduction.

With a percentage of more than 50% of Village Funds directed towards rural development, it has been proven to be true of overall poverty reduction in Pasaman District.

CONCLUSION AND RECOMMENDATIONS

Conclusion

The village fund policy that was only three years old had begun to have an impact on reducing poverty in Pasaman Regency. Although it is not so large and not all forms of policy capable of influencing poverty reduction, these results should be appreciated because basically development policies from government aid funds have a tendency to have long-term effects but for village funds within three years, they have been able to provide a reduction of numbers poverty in Pasaman Regency.

Simultaneously these three types of village fund use are jointly found to have an effect on poverty reduction. The model of this research was found to have an effect on poverty as much as 88.6%, the remaining influenced by other models outside of the observation.

Recommendations

For four years since the Village Fund was distributed to each village in Pasaman district, it still had not contributed significantly to poverty alleviation in Pasaman

district, even though the purpose of the Village Fund was disbursed to alleviate poverty. This is due to the inadequacy of the village head and the lack of experts who are able to normalize the appropriate village budget. Such as balanced infrastructure development and human resource development so that later prosperity can be achieved.

In addition to focusing on infrastructure development, village funds are also expected to have a focus on the development of human resources themselves, so in addition to encouraging facilities in village, the village is also able to improve the quality of rural community human resources so that the productivity of village communities can be better.

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Appendix 1. Poor population based on *nagari* (villages) and sub-districts in Pasaman Regency

No.	Subdistricts	<i>Nagari</i> (Villages)	Number of household			Growth per year (%)
			2016	2017	2018	
1	Bonjol	Koto Kaciak	858	870	869	0.64
2		Limo Koto	754	762	758	0.27
3		Ganggo Hilia	990	1,001	985	-0.25
4		Ganggo Mudiak	669	670	692	1.72
5	Tigo Nagari	Binjai	794	812	821	1.70
6		Ladang Panjang	1,049	1,094	1,064	0.71
7		Malampah	1,130	1,180	1,161	1.37
8	Simpang Alahan Mati	Alahan Mati	652	656	678	1.99
9		Simpang	937	954	960	1.23
10	Lubuk Sikaping	Tanjung Beringin	606	640	653	3.88
11		Jambak	276	277	278	0.36
12		Durian Tinggi	334	334	335	0.15
13		Pauah	315	319	317	0.32
14		Aia Manggih	1,219	1,247	1,240	0.86
15		Sundata	760	917	907	9.67
16	Duo Koto	Cubadak	2,992	3,014	2,986	-0.10
17		Simpang Tonang	2,558	2,569	2,568	0.20
18	Panti	Panti	804	1,282	1,239	27.05
19		Panti Timur	1,590	1,378	1,277	-9.84
20		Panti Selatan	1,384	1,589	1,590	7.44
21	Padang Gelugur	Padang Galugua	1,203	1,342	1,351	6.15
22		Sitombol	1,684	802	796	-26.37
23		Bahagia	3,261	381	379	-44.19
24		Sontang Cubadak	2,261	565	575	-37.28
25	Rao	Taruang-Taruang	1,435	1,456	1,453	0.63
26		Padang Mantinggi	708	757	771	4.45
27	Mapat Tunggul	Lubuak Gadang	289	292	293	0.69
28		Pintu Padang	373	375	360	-1.74
29		Muaro Tais	1,046	1,074	946	-4.78
30	Mapat Tunggul Selatan	Muaro Sei Lolo	1,085	1,097	1,062	-1.06
31		Silayang	540	546	547	0.65
32	Rao Selatan	LanseK Kadok	683	705	692	0.66
33		Tanjung Betung	1,092	1,121	1,117	1.14
34		Lubuak Layang	710	732	677	-2.32
35	Rao Utara	Koto Nopan	600	604	601	0.08
36		Koto Rajo	613	619	576	-3.02
37		Languang	595	599	593	-0.17
Jumlah			38,849	34,632	34,167	-6.03

Appendix 2. The results of pooled least squared model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Implementation of Village Government Sector	0.338906	0.193858	1.748218	0.0833
Development of Village Government Sector	0.045880	0.083793	0.547542	0.5852
Village Community Empowerment Sector	-0.013313	0.138671	-0.096003	0.9237
Village Community Development Sector	0.525045	0.204682	2.565178	0.0117
C	-11.85717	4.753418	-2.494451	0.0142
R-squared	0.133917	Mean dependent var		6.714416
Adjusted R-squared	0.101235	S.D. dependent var		0.568482
S.E. of regression	0.538939	Akaike info criterion		1.645572
Sum squared resid	30.78831	Schwarz criterion		1.767623
Log likelihood	-86.32924	Hannan-Quinn criter.		1.695084
F-statistic	4.097538	Durbin-Watson stat		0.648908
Prob(F-statistic)	0.003972			

Appendix 3. The result of fixed effect model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Implementation of Village Government Sector	0.015512	0.045936	0.337677	0.7366
Development of Village Government Sector	-0.062674	0.018828	-3.328713	0.0014
Village Community Empowerment Sector	-0.163220	0.088554	-1.843167	0.0695
Village Community Development Sector	-0.232499	0.075423	-3.082597	0.0029
C	15.59188	1.356653	11.49290	0.0000
Effects Specification				
Cross-section fixed (dummy variables)				
R-squared	0.886027	Mean dependent var		6.714416
Adjusted R-squared	0.820899	S.D. dependent var		0.568482
S.E. of regression	0.240583	Akaike info criterion		0.266204
Sum squared resid	4.051626	Schwarz criterion		1.267021
Log likelihood	26.22569	Hannan-Quinn criter.		0.672206
F-statistic	13.60448	Durbin-Watson stat		2.176989
Prob(F-statistic)	0.000000			

Appendix 4. The result of random effect model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Implementation of Village Government Sector	0.086731	0.108339	0.800556	0.4252
Development of Village Government Sector	-0.058677	0.045653	-1.285280	0.2015
Village Community Empowerment Sector	-0.115715	0.073960	-1.564547	0.1207
Village Community Development Sector	0.016109	0.136089	0.118370	0.9060
C	7.901634	3.209057	2.462292	0.0154
Effects Specification				
			S.D.	Rho
Cross-section random			0.365663	0.6979
Idiosyncratic random			0.240583	0.3021
Weighted Statistics				
R-squared	0.035629	Mean dependent var		2.384312
Adjusted R-squared	-0.000763	S.D. dependent var		0.282379
S.E. of regression	0.282487	Sum squared resid		8.458655
F-statistic	0.979039	Durbin-Watson stat		1.115773
Prob(F-statistic)	0.422274			
Unweighted Statistics				
R-squared	-0.038372	Mean dependent var		6.714416
Sum squared resid	36.91299	Durbin-Watson stat		0.255681

Development of small medium enterprises of maize processed food products as a locomotive of Gorontalo District's economy

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Abstract

This study aims to analyze the development of small medium enterprises (SMEs) of maize processed product as a locomotive of Gorontalo District's economy. Primary and secondary data were used for this study. Data were analyzed descriptively and regression analysis was conducted to analyze the effect of the components of production costs on the selling prices of maize processed food products and the effect of selling prices on SMEs revenues. The results of the study found that the potential for development of SMEs of maize processed food products in Gorontalo District is quite prospective because human resources and raw materials were still cheap and easily obtained. On the demand side, maize processed products are also relatively high on demand. Maize processed product has been an alternative substitute for pastries which are always served by Muslims on religious observances. In increasing the competitiveness of maize processed products, it is necessary to pay attention and make raw material costs and labor costs efficient. Those two cost components have a significant effect on the selling prices of maize processed food products.

Keywords: *Maized, Food products, Economy, SMEs*

JEL classification: L25, M21, Q12

INTRODUCTION

There are many secondary product and by other product is produced by small medium enterprise and manufacture and also marketed in the world such as in United Stated of American is highest level produced and consumed, followed by Asian Countries like China People of Republic and also African and Latin American, (Mejia, 2003).

The maize commodity is planted by farmers in high land of Mexico, Peru, Ecuador and Also Bolivia since 5000 ago. This commodity is developed and brought by occupation country lake Portugal, Spain, and Holland into reviews their occupation countries including Indonesia so, that is the way also this commodity and become has developed one of the resource of food (IITA, 1982)

Maize is resource based food in population of the world, many people like in Africa's food made from maize and also some countries in Asia like China, India, Indonesia maize become one the special food. In the other hand maize not only resource of food for human kind but also it's the resource of food for animals, (Gwartz, & Garcia-Casal, 2014).

Since the formation of Gorontalo Province, on 12 February 2000, the question that always arises in the minds of the community is how far the impact of the corn agropolitan program can improve the welfare of farmers in particular and the people of Gorontalo in general. The answer is very dependent on the multiply effect of the maized agropolitan program itself (Muhammad, 2008).

The agricultural sector basically has a varied land area in the size of the soil texture, because it is affected by the rainy climate is not too good compared to other regions in Indonesia. The logical consequences of this indicator more professional provide motivation for related agencies to manage maize farming; this has become part of the obstacles encountered today, why, because Gorontalo is tin the fifth position of poor province in Indonesia, also is in the eight position of Gross Regional Domestic Product in national level (BPS, 2018).

The competitiveness of maize products currently lies in its downstream industry, no longer in primary products, where domestic added value that can be created in downstream products can double than the primary product. Maize is a second carbohydrate source commodity after rice, which is very important for food security. Also maize plays an important role in the husbandry of feed industry and the food industry.

Besides being able to fulfil the daily needs the people of Gorontalo, maized can also be processed for various products such as maize sticks, maize oil, maize flour the which is known as maize starch, poultry feed, fish feed, and many more. Maize waste can also be empowered into various products such as maize waste into ruminants feed, maize waste into organic fertilizer, maize cobs into charcoal briquettes, and maize husk can be processed to be used as flowers, dodol pads, basic material for clothes, table mats and many other unique products.

Based on the survey results that maize seeds (yield) in Gorontalo beside food for daily use, they are also sold to other places to neighbour countries or neighbour provinces. Maize seeds (yield) are generally not processed into other processed products that can increase of the economic value of the product. As an illustration, the price ratio of 1 kg of maize worth Rp. 3,200 if it has been processed into animal feed price reaches 5 times the original price when not processed. By processing maize kernels into basic ingredients, animal feed will increase of the economic value of the product.

Based on the explanation above, this study aims to analyze the development of SMEs of maize processed products as a locomotive of Gorontalo District's economy.

RESEARCH METHOD

The data used consists of secondary data and primary data. Secondary data includes data on the number of SME units, labors, investment value, production costs, and production value, both in SMEs of maize and non-maize processed products. Data were obtained from Cooperative, Industry, and Trade Office of Gorontalo District. Primary data were obtained from surveys on SMEs of maize processed products in Toidito village, Pulubala sub-district, Gorontalo District. The village is the center for the development of SMEs of maize processed products.

Primary data collection of SMEs of maize processed products in Toidito village was conducted by observation, independent surveys, structured questionnaire interviews, and focus group discussion. Data were analyzed descriptively and regression analysis was conducted to analyze the effect of the components of production costs on the selling prices of maize processed food products and the effect of selling prices on the revenue of SMEs.

RESULTS AND DISCUSSION

Maize processed products as an economy locomotive of Gorontalo District

The development of SMEs of maize processed products in Gorontalo District has good prospects. SMEs of maize processed products are able to produce 480.68 percent of the total investment. Otherwise, SMEs of processed non-maize products are only able to produce a production value of 82.82 percent of the total investment. These figures can be seen in Table 1.

Table 1. Number of units, labor, investment and production of SMEs in processed food with maize and non-maize-based, Gorontalo District, 2016

SMEs type	Unit	Labor	Labor per unit	Investment per unit (Rp. 000)	Production per unit (Rp. 000)	Production/Investment (%)
maize based	24	71	2.96	18,056	86,792	480.68
non maize based	224	984	4.39	96,402	79,840	82.82

Source: Department of Industry and Commerce Gorontalo District

However, Table 1 also shows that the number of SME units of maize processed food product was still relatively small. There were only 24 units of SME of maize processed food product. On the other hand, there were 224 units of SME of non-maize processed food product. In addition, in terms of labor absorption, it was also relatively low. The average number of labors in SME of maize processed food product was only 2.96 per business unit, whereas for SME of non-maize processed food product, it reached 4.39 per business unit.

There are various types of maize processed products, namely sticks, dodol, pie, maize milled, flour and maize rice. Of these types, SME that produce maize milled was the largest in number, as many as 10 units or 41.67 percent of the total SMEs of maize processed food products (Table 2). Furthermore, in terms of labor absorption, SMEs that produce stick and dodol had the highest labor absorption of 7 workers per business unit.

Table 2. Number of units, labor, investment and production of SMEs of maize processed products, Gorontalo District, 2016

Processed product	Number units of SMEs	Labor	Labor per unit	Investment per unit (Rp. 000)	Production per unit (Rp. 000)	Production/Investment (%)
Stick	2	14	7	32,533	195,000	599.39
Dodol	2	14	7	41,217	197,000	477.96
Pie	1	6	6	15,000	43,200	288.00
Maize milled	10	20	3	4,500	56,000	1244.44
Flour	3	6	2	5,000	7,200	144.00
Maize rice	6	11	1.8	10,083	22,350	221.66

Source: Department of Industry and Commerce Gorontalo District

In terms of the ratio of production-investment value, the type of corn processed products has the best prospects among various types of processed corn products in Gorontalo Regency. The production-investment value ratio for this type of product is 1,244.44 percent. On the contrary the lowest ratio is for SMEs that produce flour.

The development of SMEs of maize processed products in Gorontalo District has good prospects because of the enormous support of human resources, especially among women as laborers in SMEs. It is also supported by the availability of raw material sources which are still cheap and easily obtained.

On the demand side, maize processed products are also relatively high on demand. Maize processed product has been an alternative substitute for pastries which are always served by Muslims on religious observances. Another thing that needs to be considered is the demand from outside Gorontalo continues to increase. However, the fulfillment of request from outside Gorontalo is still constrained by the pricey transportation costs of products.

Toidito Village: development center of small and medium industries of corn

Toidito Village as a center for the development of small-scale industries based on maize processing. The potential of the area in this village is dominated by dry land farming systems that are dominated by plains that are used by the community by cultivating various agricultural, including maize, peanuts, cayenne pepper, banana, vegetables and annual crops, namely coconut

There are a number of leading agricultural commodities in the region but have not yet entered the downstream phase so that the economic added value of this commodity is still small. There is one commodity that has been included in the downstream phase items, namely the coconut commodity the which has been developed with various derivative products including nata de coco, coconut cake, packaged coconut water but begins to experience a decline in production due to the decreasing coconut supply of raw materials from cassava farmers as well as the which has been processed into maize starch. Maize commodities have not experienced downstream progress. Until now has only been developed into a shell maize with a drying system using technology

Based on the result of the survey, basically there is potential for developing SMEs in Toidito Village in the future. It can be seen from the high motivation of the SMEs' actors to continue their business and the willingness to gradually improve various aspects of the business. SMEs' actors also have high curiosity and are willing to open up to receive new information and ideas.

Coaching conducted by researchers in the last three years (2016 – 2018) have proven to be able to increase the quantity and quality of maize processed production such as Limboto lake shrimp flavored sticks, banana root sticks (*stik akar pisang*), and sweet corn dodol (*dodol jagung manis*). These products have also been able to penetrate the markets outside Gorontalo District, including markets in the South Bolaang Mongondow District and North Bolaang Mongondow which are the regions of North Sulawesi Province.

Effect of components of production costs on selling prices and its impact on the revenues of SMEs of maize processed products

The model estimation of the effect of production costs' components on selling prices of maize processed products is given in Table 3. Simultaneously, all cost components have a significant effect on the selling prices of maize processed products. It can be seen from the F probability value < 0.01 . Furthermore, the model has an R-square value of 0.923 which indicates that 92.3 percent of the selling prices is determined by the component of production costs. The amount of the contribution of the cost component to the selling prices is in line with Sunarto (2004) who argued that the factor with a high certainty to determine the selling prices is the production costs. Research by Slamet and Sumarli (2002) on small industry of pressed tile in Magelang District found that production costs contributed to the selling prices of 21 percent.

Partially, of the four cost components, only two of them have a significant effect, namely raw material costs and labor costs. The other two components, namely transport costs and rental costs, have no significant effect on selling prices.

Table 3. The model estimation of the effect of production costs' components on selling prices of maize processed products

Variable	Coefficient (β)	t-stat	Sig. (P-value)
Raw Materials	0.721	5.883	0.000
Labor Wage	1.059	3.390	0.003
Transport Charges	-0.269	-0.274	0.787
Tool Rent	-1.203	-1.093	0.286
F-statistic = 65.621		$R^2 = .923$	

There is a positive and significant influence of raw material costs on the selling prices of maize processed products. This finding is in accordance with the findings of several MSME researchers. Study by Sayyida (2014) showed one of the production variables, direct labor cost, affected the selling prices of the product, but the effect was relatively low. Aprilla's research on the bread industry in Padang City found that a 3.11 percent increase in raw material costs caused an increase in production costs.

Labor costs have a positive and significant effect on the selling prices of maize processed products. This is in line with the research by Sayyida (2014) which showed one of the production variables, direct labor cost, affected the selling prices of coconut aminos in Sumenep, but the effect was relatively low. This research also supports the results of Ndenge's research (2015) on SMEs in Ganteng Province, South Africa. Transport cost has no significant effect on the selling prices of maize processed products. The same thing is also applied to the rent cost of equipment. It is due to the small composition of transport costs and rent cost of equipment from the total costs of production as a whole in producing maize processed food products. This fact contradicts the results of Kinyua's research (2014) on SMEs in Nakuru Tawon, Kenya that found a significant effect of transport costs on the selling prices of MSME products. Likewise, it also contradicts the findings of Moorthy, Tan, Choo, Wei, Ping & Leong's research (2012) on SMEs in Malaysia..

Furthermore, model estimation of the effect of selling prices on revenues is given in Table 7. Based on Table 7, it can be seen that the selling prices has a significant effect on revenues of SMEs of maize processed products. Referring to the coefficient value, it indicates that an increase in the selling prices of Rp. 1 will be able to increase revenue by Rp.0.636.

Table 4. The model estimation of the effect of selling prices on revenues

Variable	Regression coefficient (β)	t-stat	Sig. (P-value)
Selling prices	.636	9.631	0,000
$R^2 = .788$			

The significant effect of selling prices on revenues of SMEs of maize processed products supports several related studies such as a research by Jonga, et al. (2018) on SMEs in Kenya, and a research by Malik, Antara, and Sulaeman (2017) on SMEs in Palu City.

CONCLUSION AND RECOMMENDATION

Conclusion

The development of SMEs of maize processed products in Gorontalo District has good prospects because of the support of human resources, especially the workforce of housewives and raw material sources that are still cheap and easily obtained. On the demand side, maize processed products are also relatively high on demand. Maize

processed product has been an alternative substitute for pastries which are always served by Muslims on religious observances.

Two cost components, namely raw material costs and labor costs, have a significant effect on the selling prices of maize processed food products. Based on the finding, it can be concluded that the competitiveness of maize processed products is determined by the efforts of SMEs to make both costs efficient.

Recommendation

To maintain and to improve the capacity of SME at process of maize productions should have permanent legal cooperation between government, businessman, non-government organization and university research institution.

Furthermore, in order to improve the competitiveness of maize processed products, the government needs to formulate policies to strengthen internal markets such as by increasing demand for maize processed products in government events.

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